



***Alaska Population Projections  
2007 - 2030***



ALASKA DEPARTMENT OF LABOR  
& WORKFORCE DEVELOPMENT

*Presentation given to the Federal and  
State Cooperative for Population Projections  
in April of 2008*

# Welcome!

Alaska Department of Labor and Workforce  
Development



**ALASKA DEPARTMENT OF LABOR  
& WORKFORCE DEVELOPMENT**

# What Will Be Covered

Alaska Population Projections:  
Methods and Results

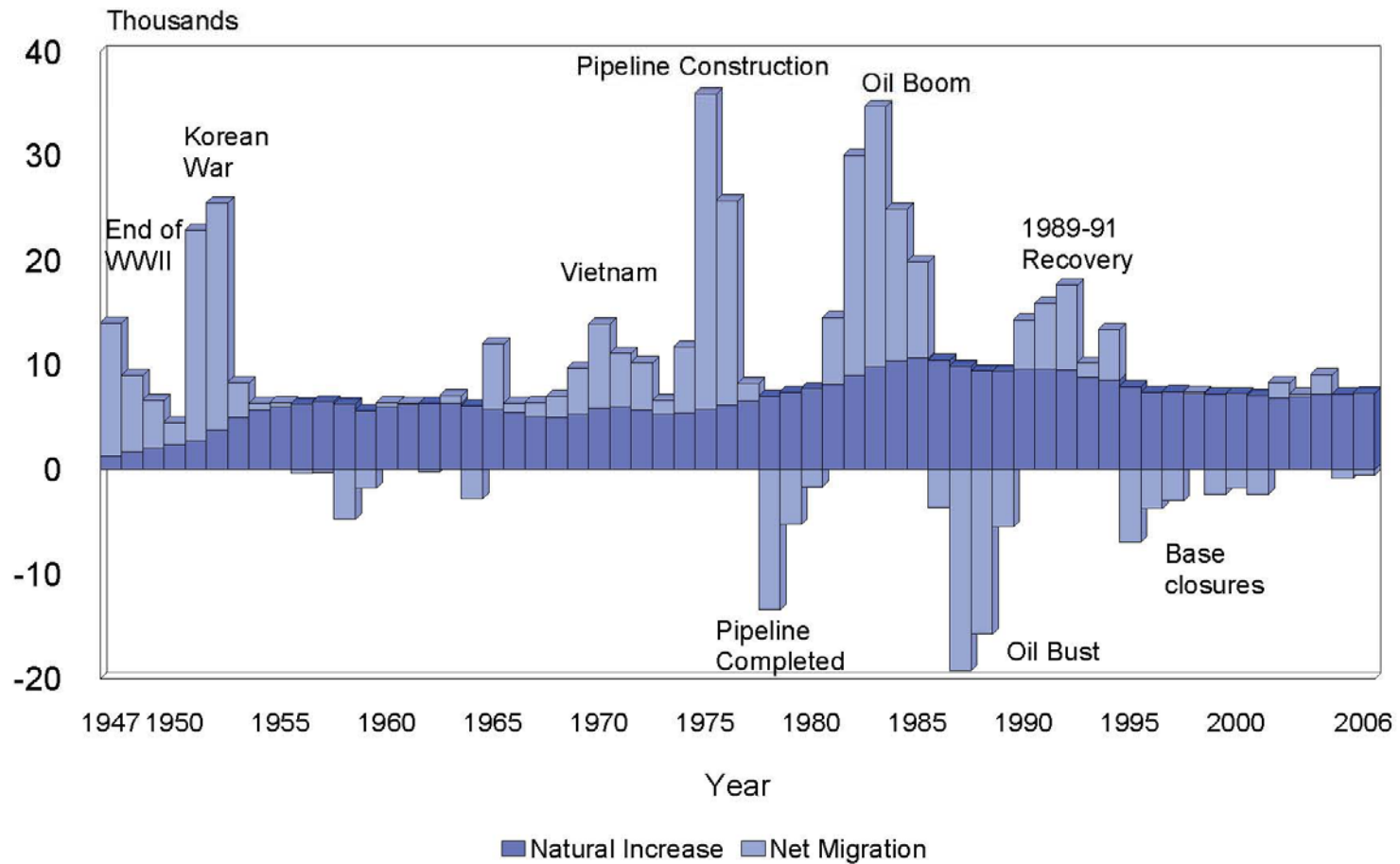
# Preface: What These Projections Do and Don't Offer

Do: Projected future population levels for Alaska, based on recent history of fertility, mortality and migration rates.

Do not: A crystal ball gaze into the future.

# **A VERY Brief Overview of Alaska's Population History**

## Components of Population Change for Alaska, 1947-2006



Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section, Demographics Unit.

# Methods

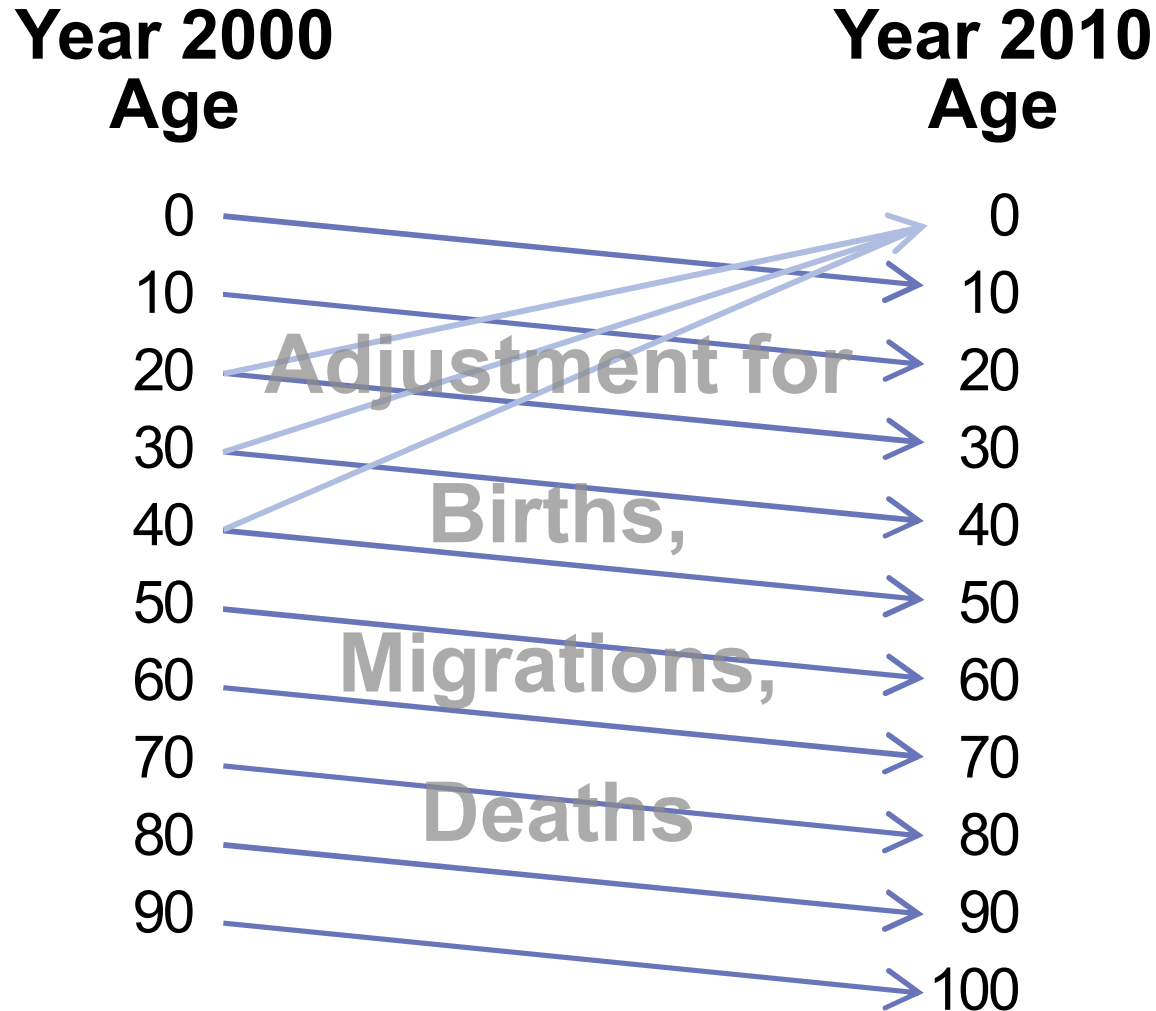
# Statewide Methods

“Cohort component” with  
“quantified uncertainty”.

Used a relatively simple design to  
quantify uncertainty.



# The Cohort-Component Method



# Quantified Uncertainty

Uncertainty was quantified through 90% confidence intervals (slightly over-estimated these to provide continuous “variants”).

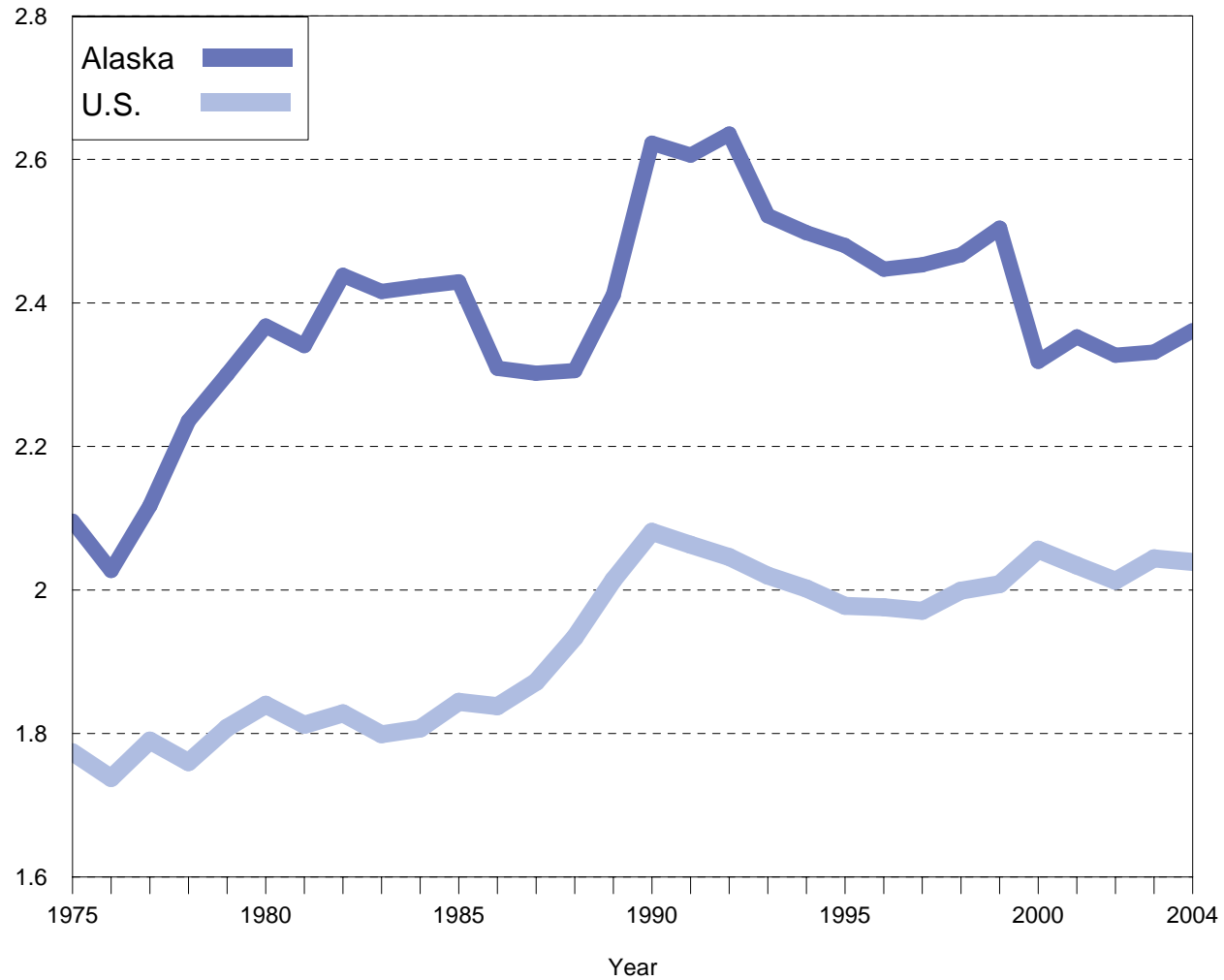
The intervals were calculated through the simulation of 2,000 potential futures for fertility and migration.

# Births

# Used the Total Fertility Rate as an Index Value

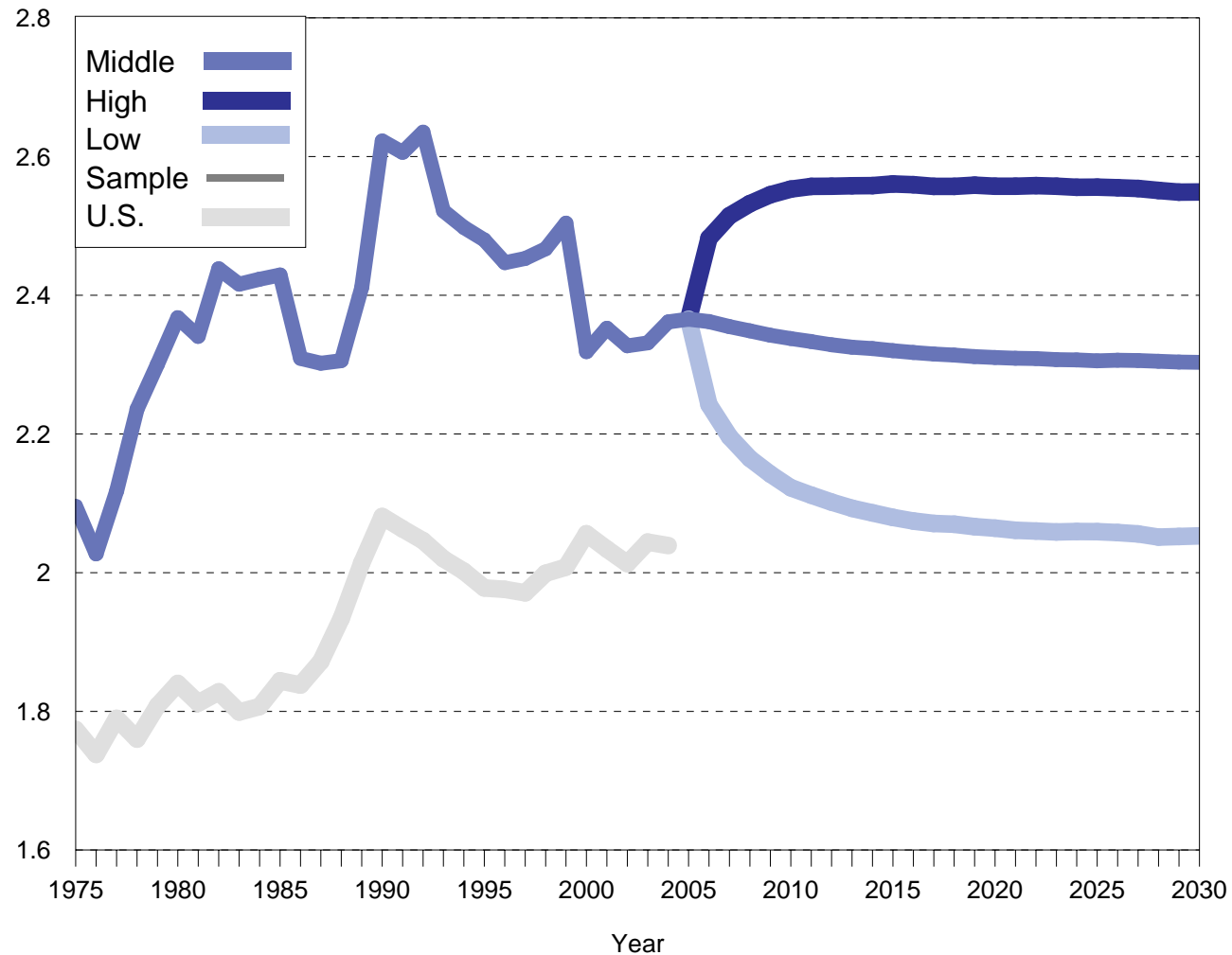
Projected 2,000 potential paths for the TFR,  
based on an autoregressive model.

## Total Fertility Rate, Alaska and the United States 1975-2004 Estimates



Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section  
and U.S. National Center for Health Statistics

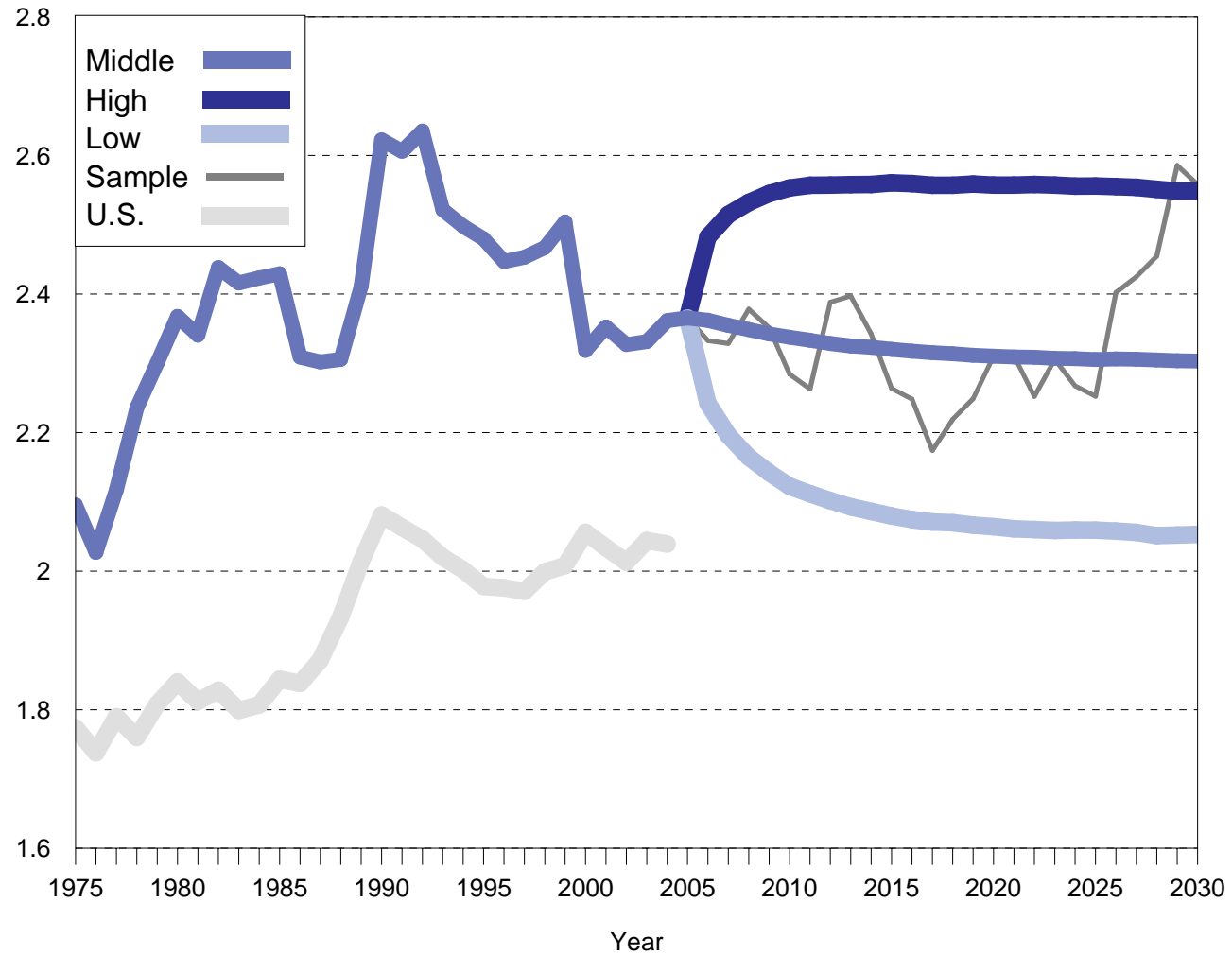
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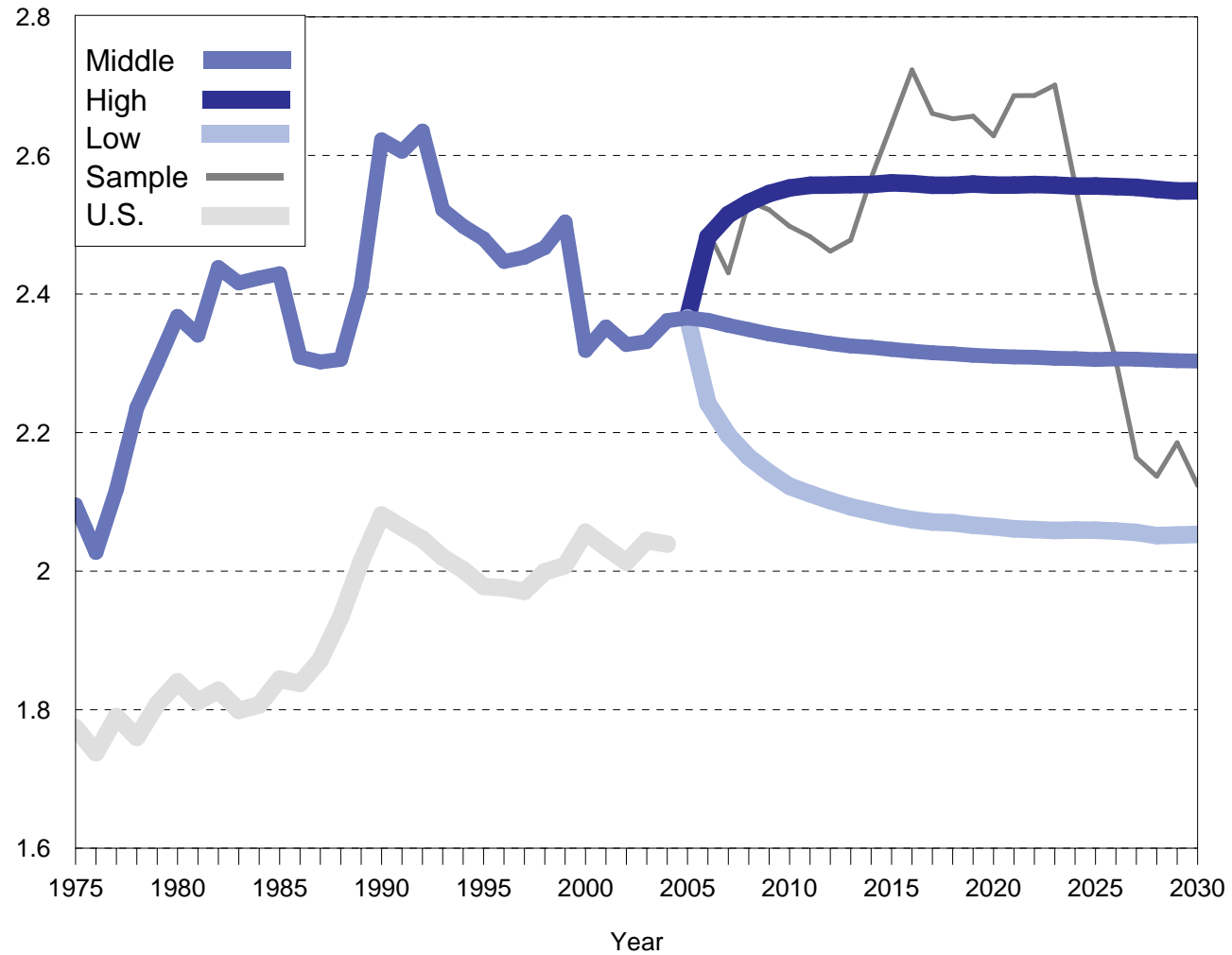
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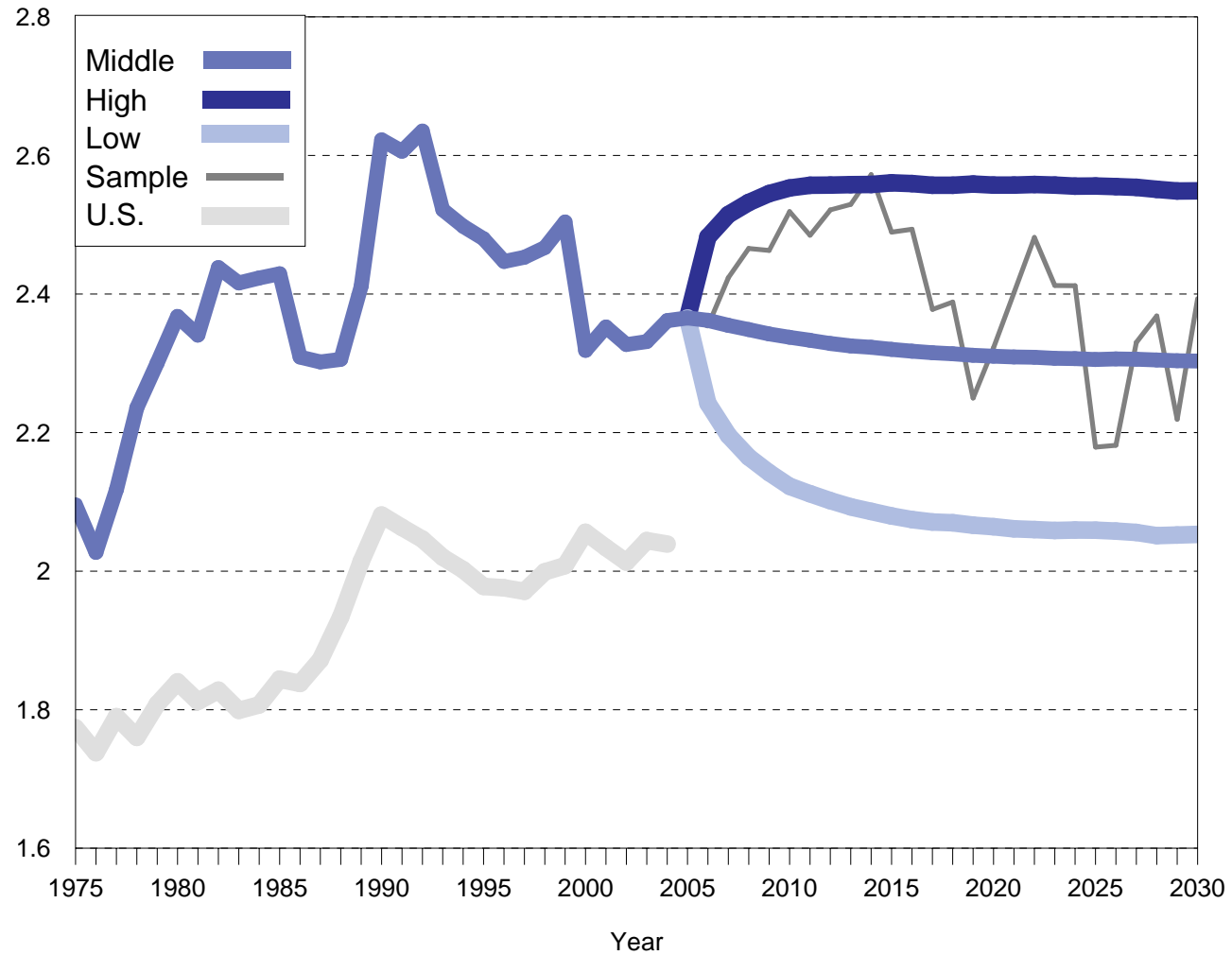


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Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section and U.S. National Center for Health Statistics



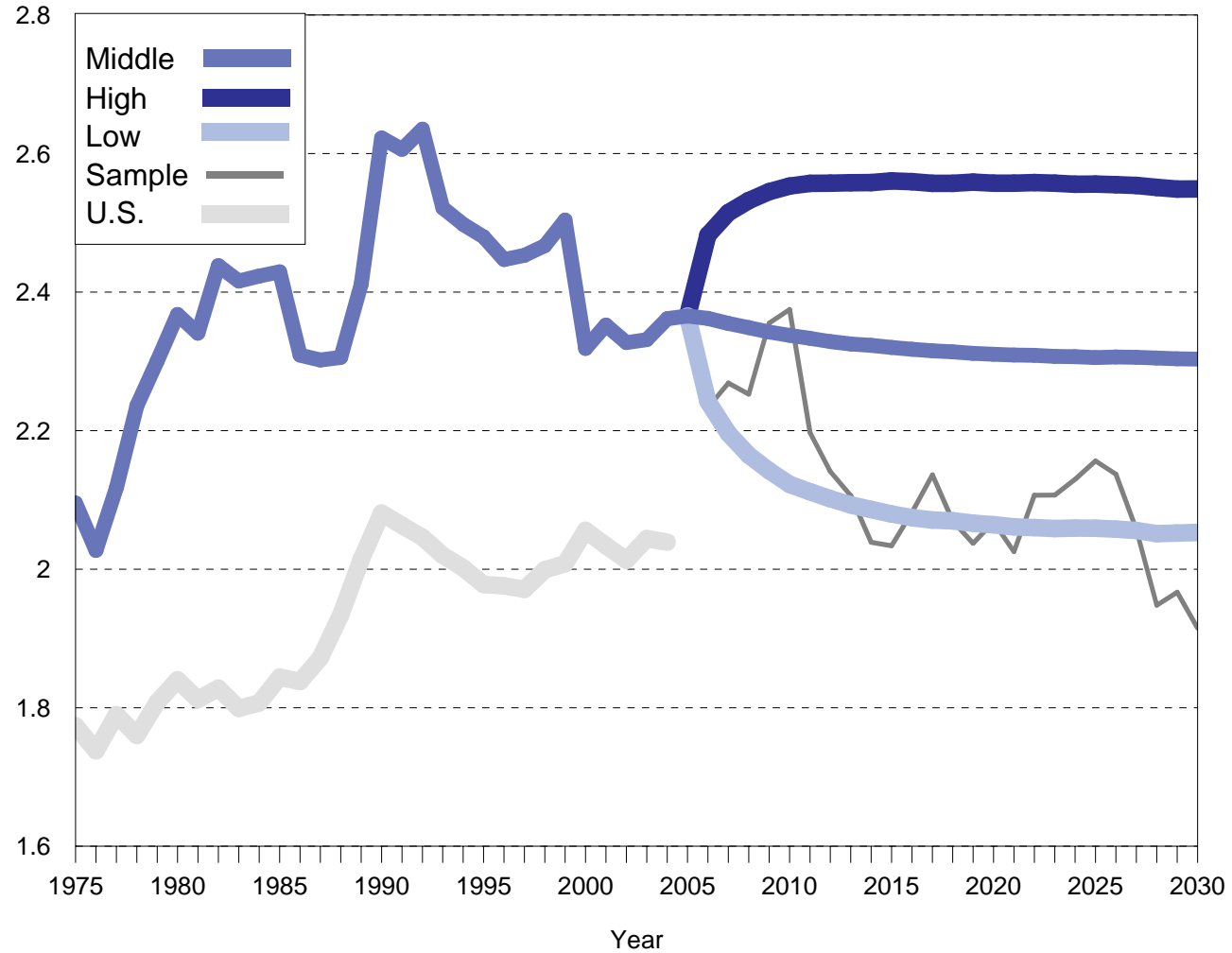
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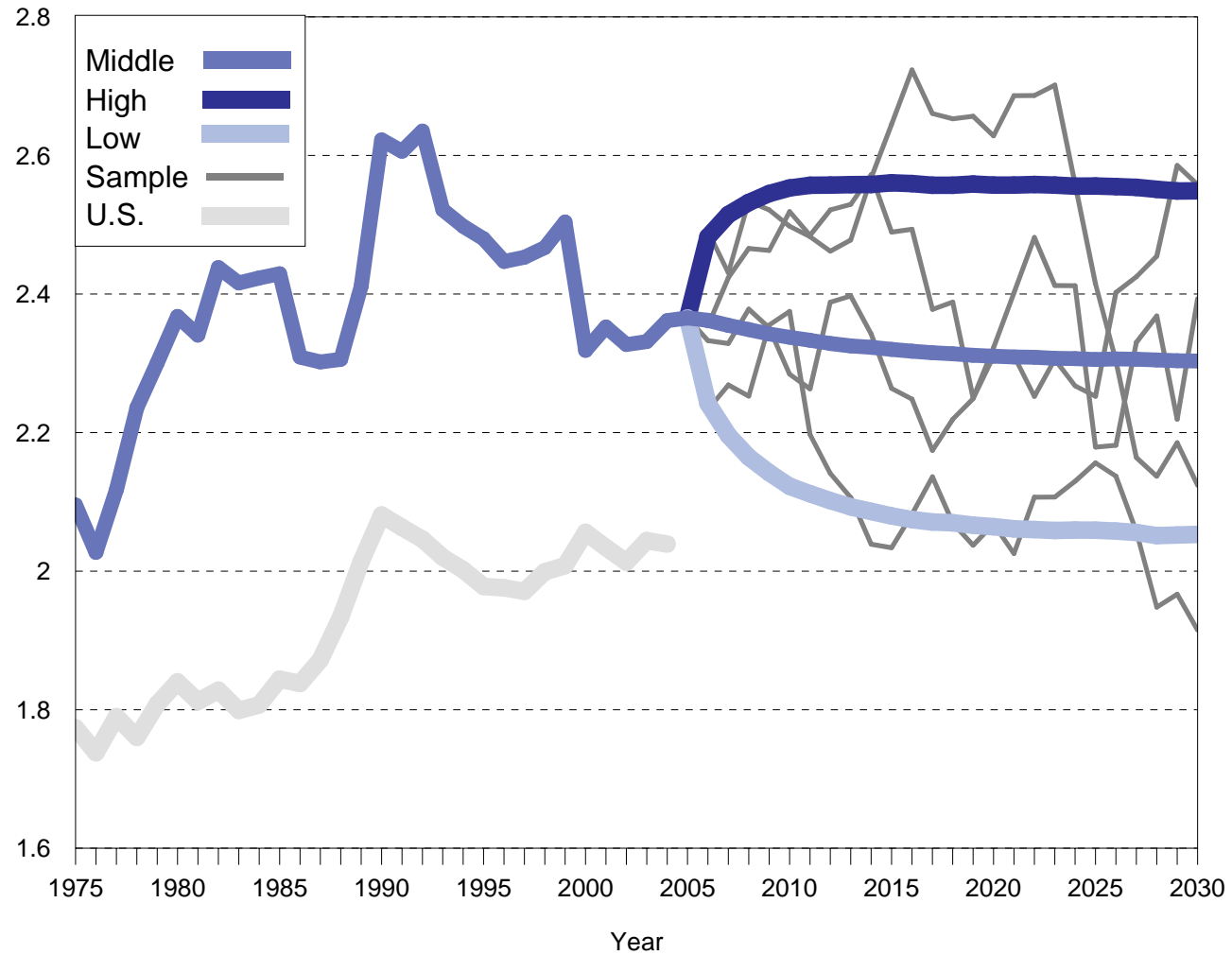
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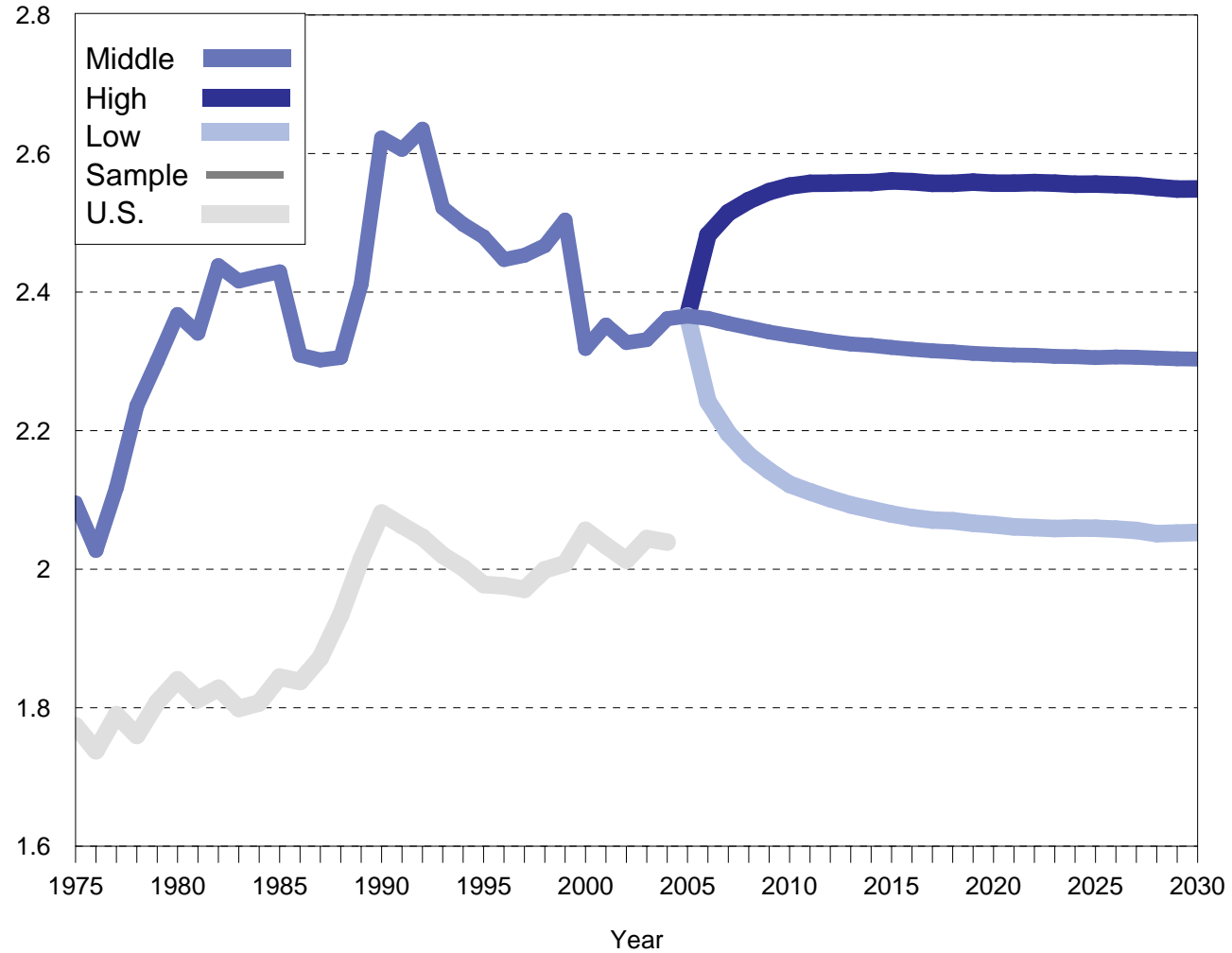
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Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section and U.S. National Center for Health Statistics

# Age Specific Fertility Rates

Used a fixed age profile for fertility, and shifted it up and down with the projected TFR paths.

# Migration

# Used Crude Migration Ratios (In and Out) as Index Values

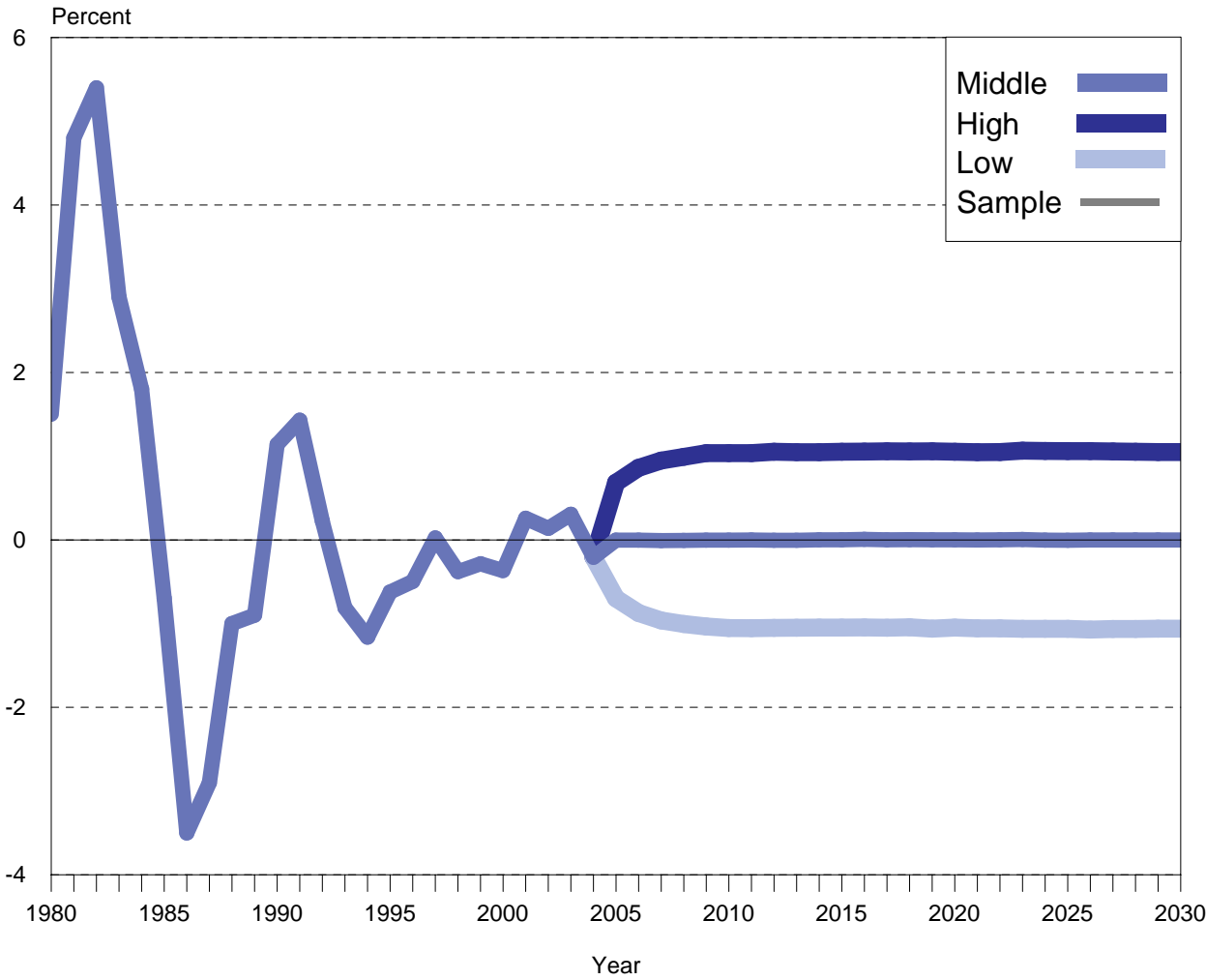
Projected 2,000 potential paths for In- and Out-Migration, based again on autoregressive models.

Adjusted the models based on expert judgment.

Together, these yielded Net-Migration Ratios.

# Net Migration Ratio, Alaska

## 1975-2005 Estimated, 2006-2030 Projected\*

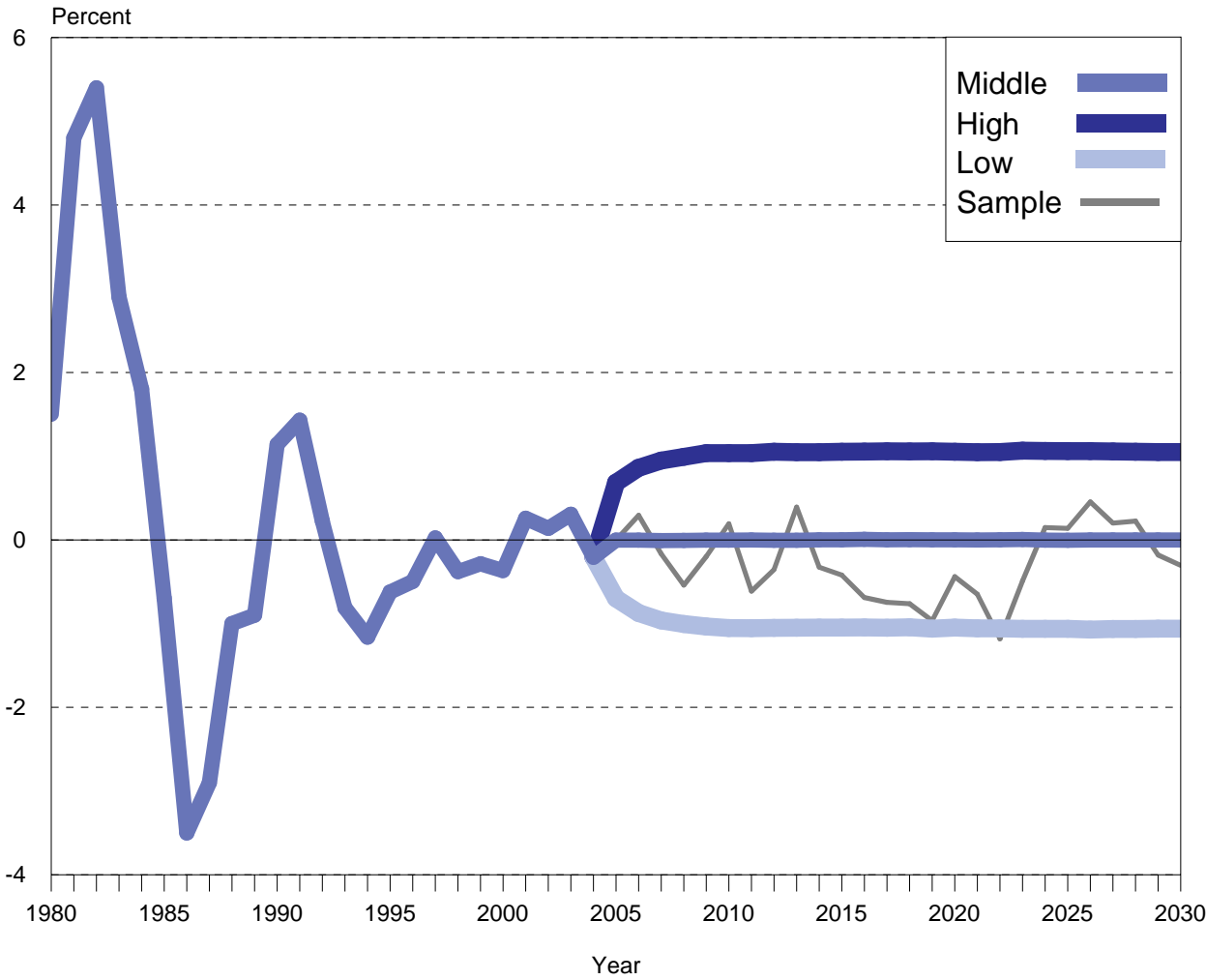


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 Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section



# Net Migration Ratio, Alaska

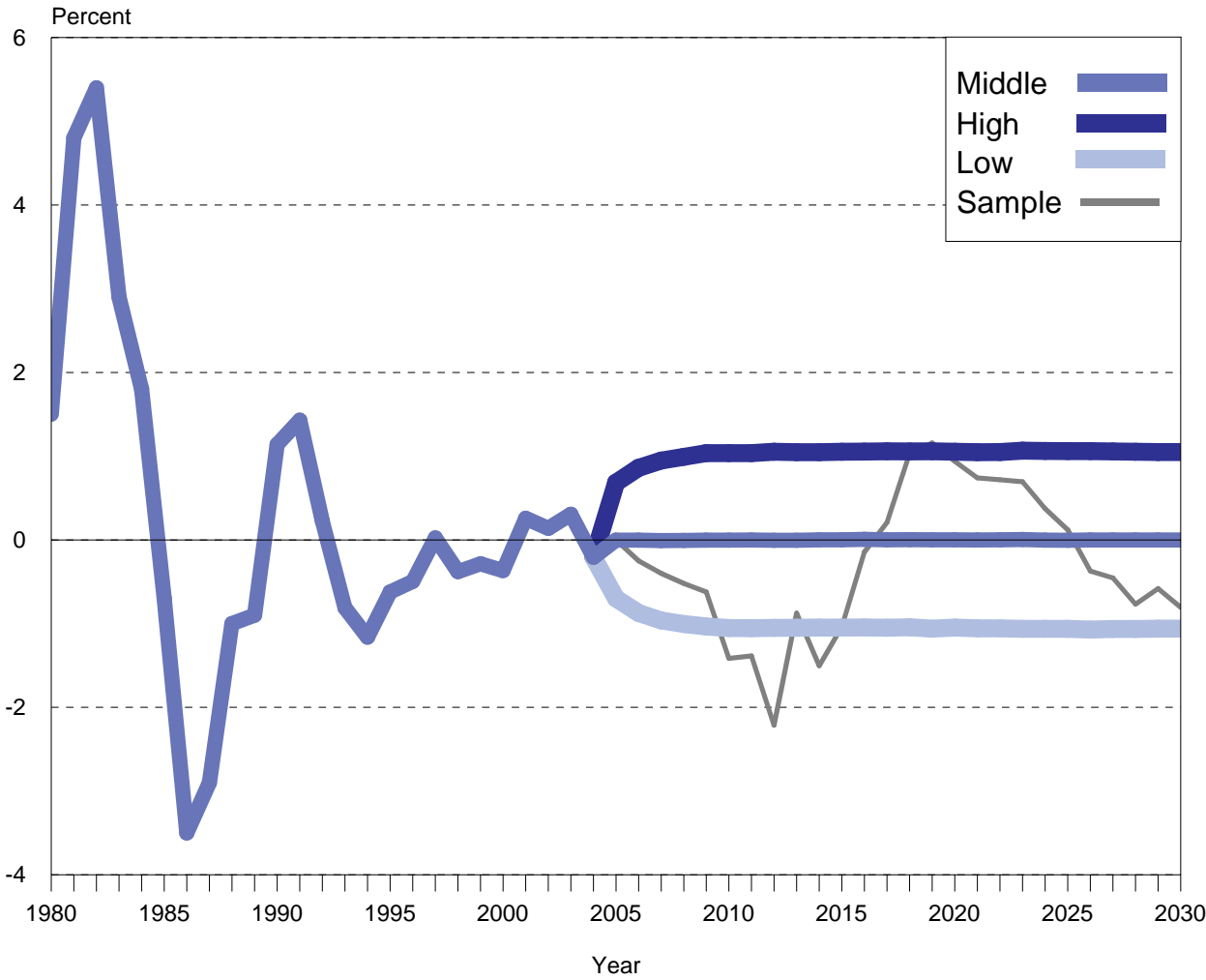
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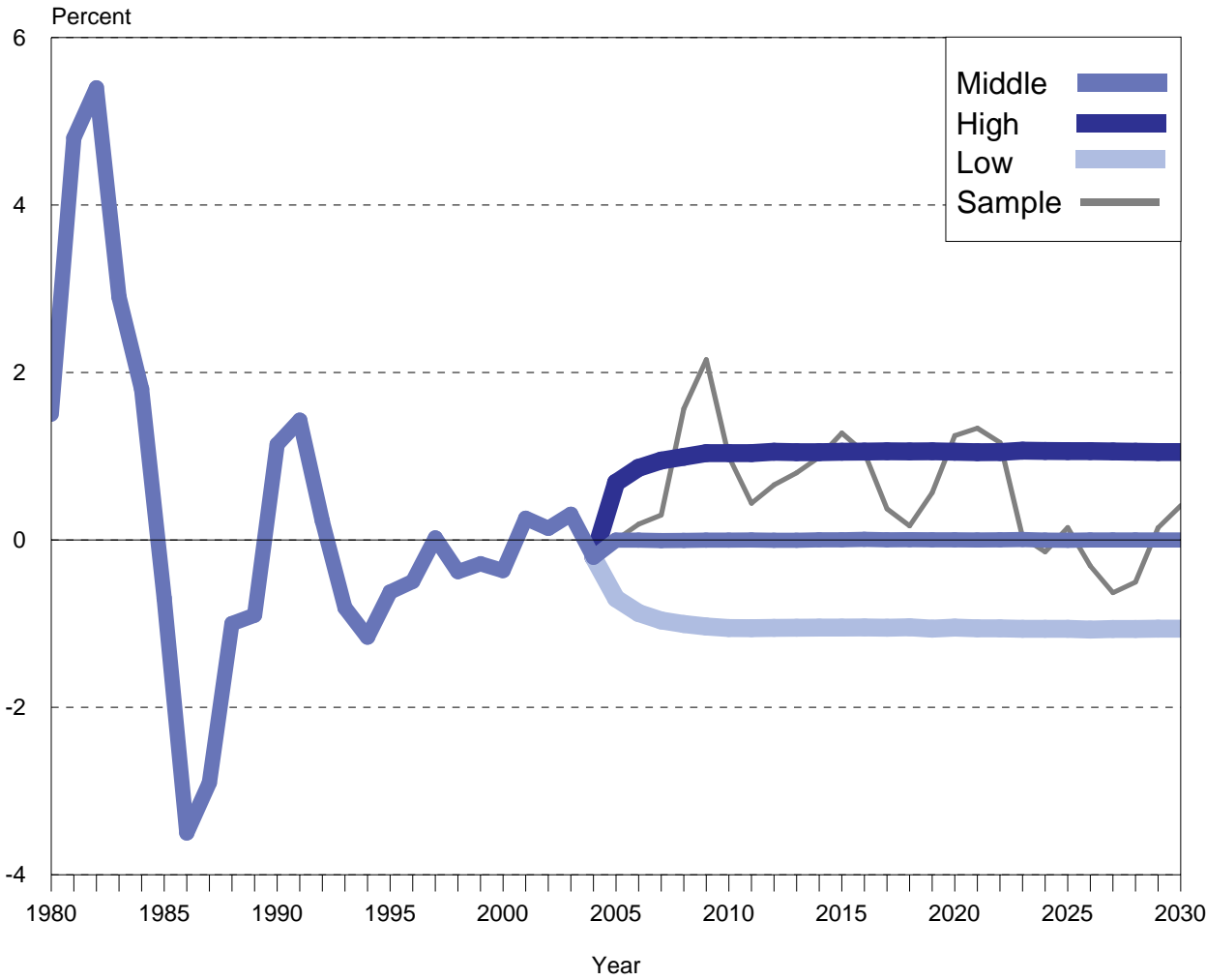
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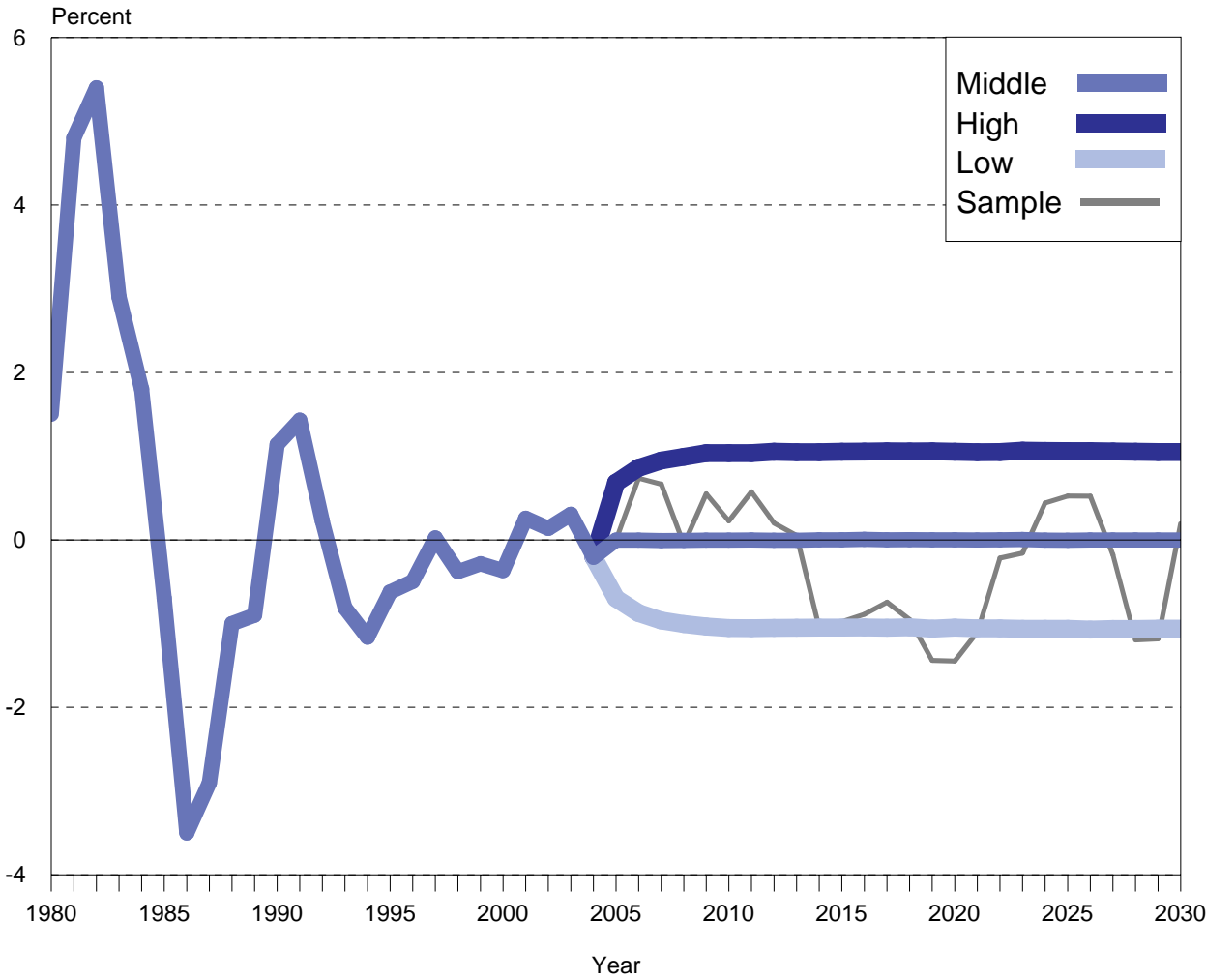
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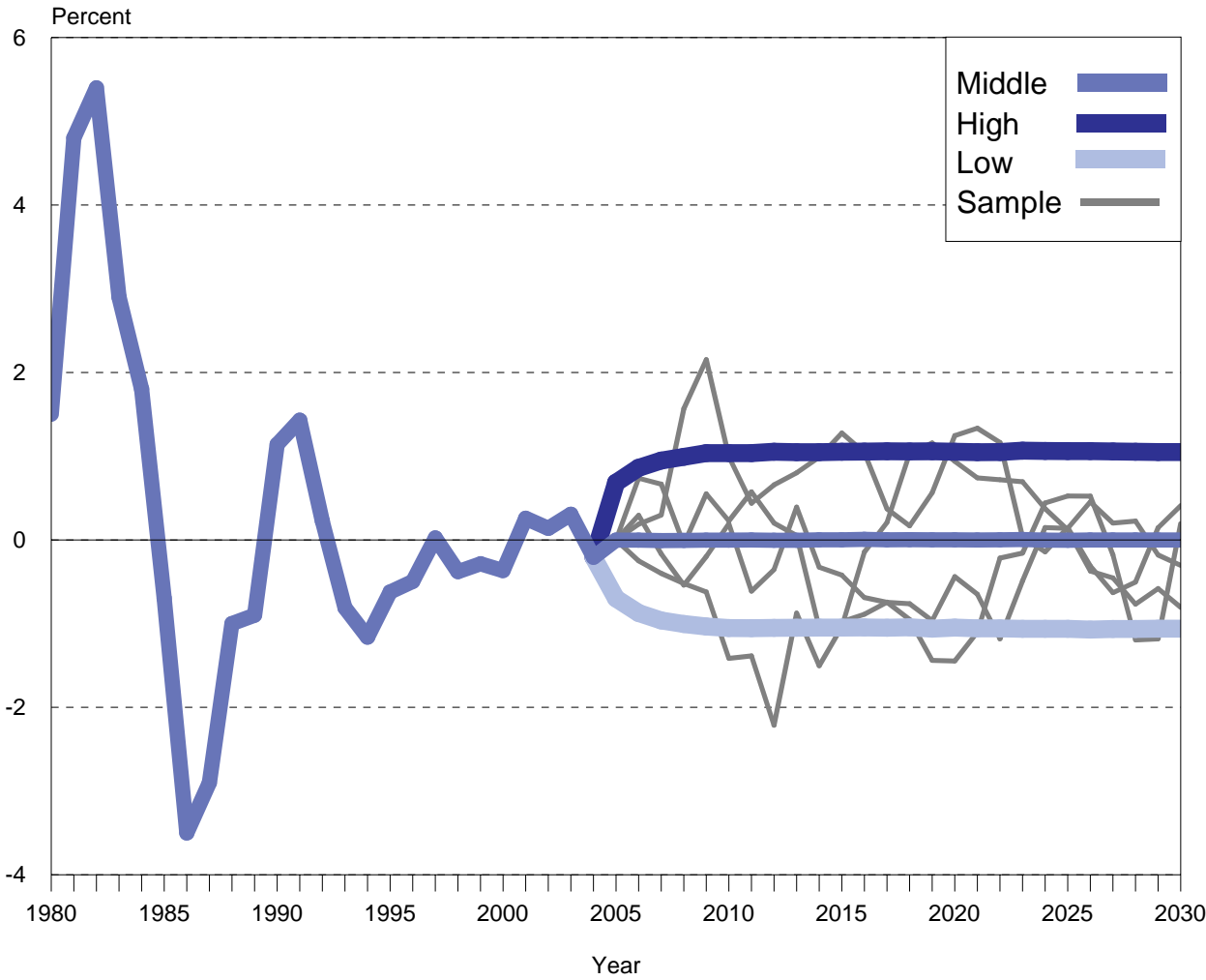
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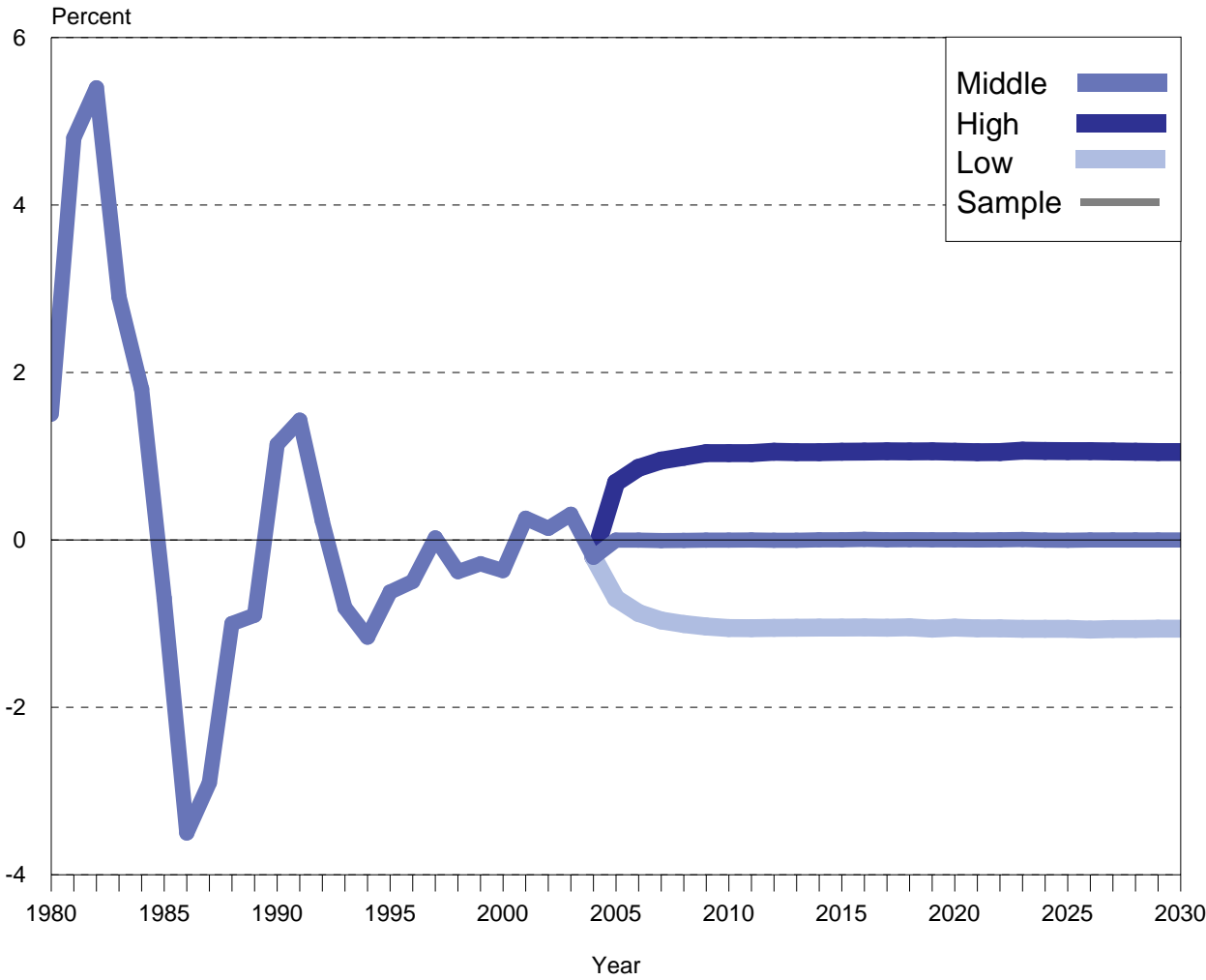
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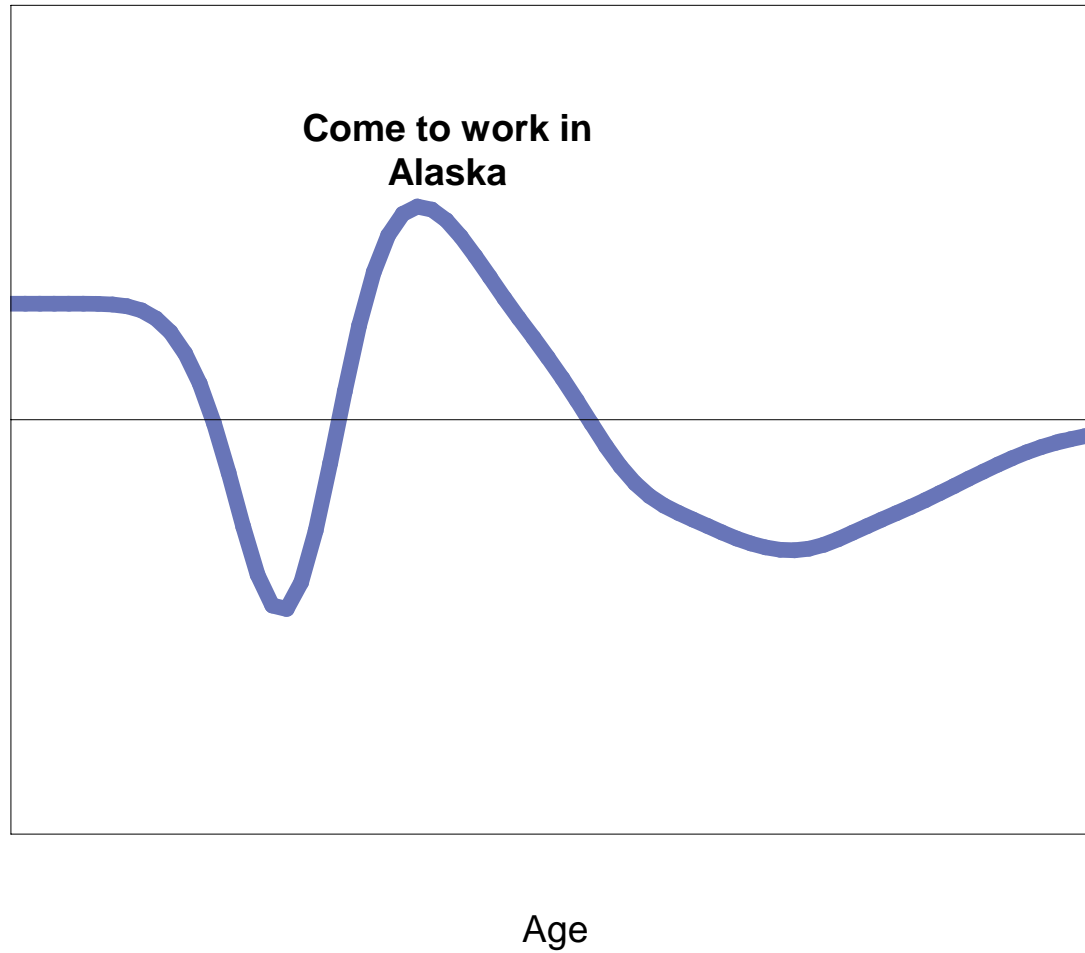
\* "Middle" is the median of the distribution, "High and "Low" are the 90% confidence bounds.  
 Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Age Specific Migration Shares

Used fixed age profiles for In- and Out-Migration shares, and shifted them up and down with the projected Migration paths.

These yielded an age pattern for Net-Migration.

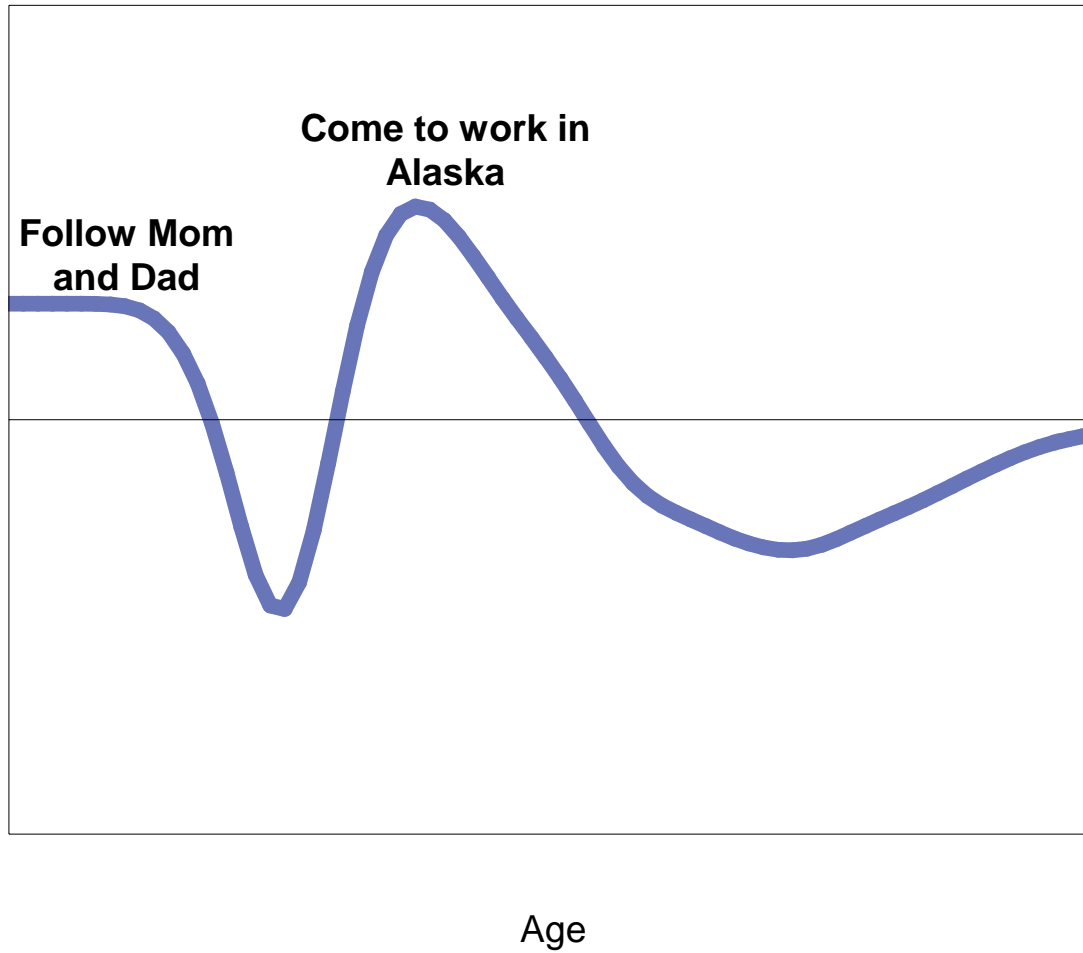
## Net Migration Across Age Alaska, Stylized



Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section

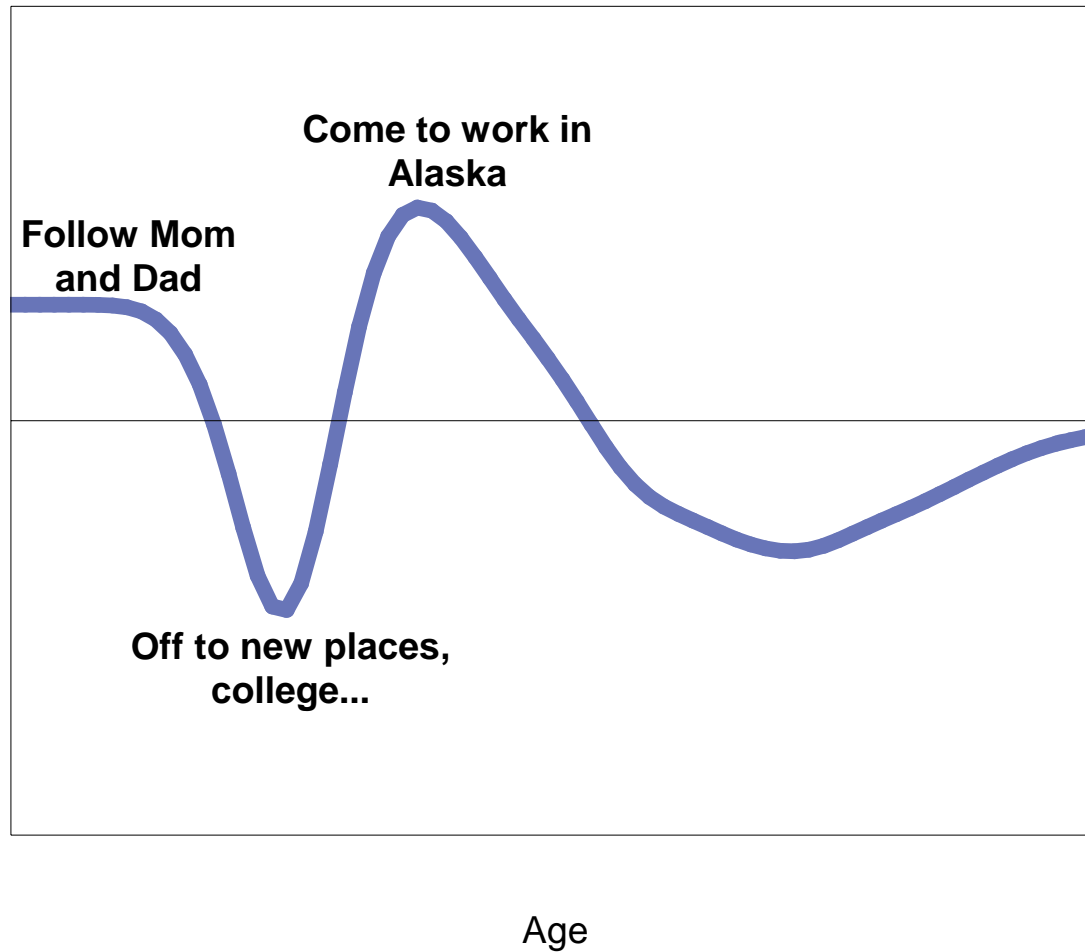


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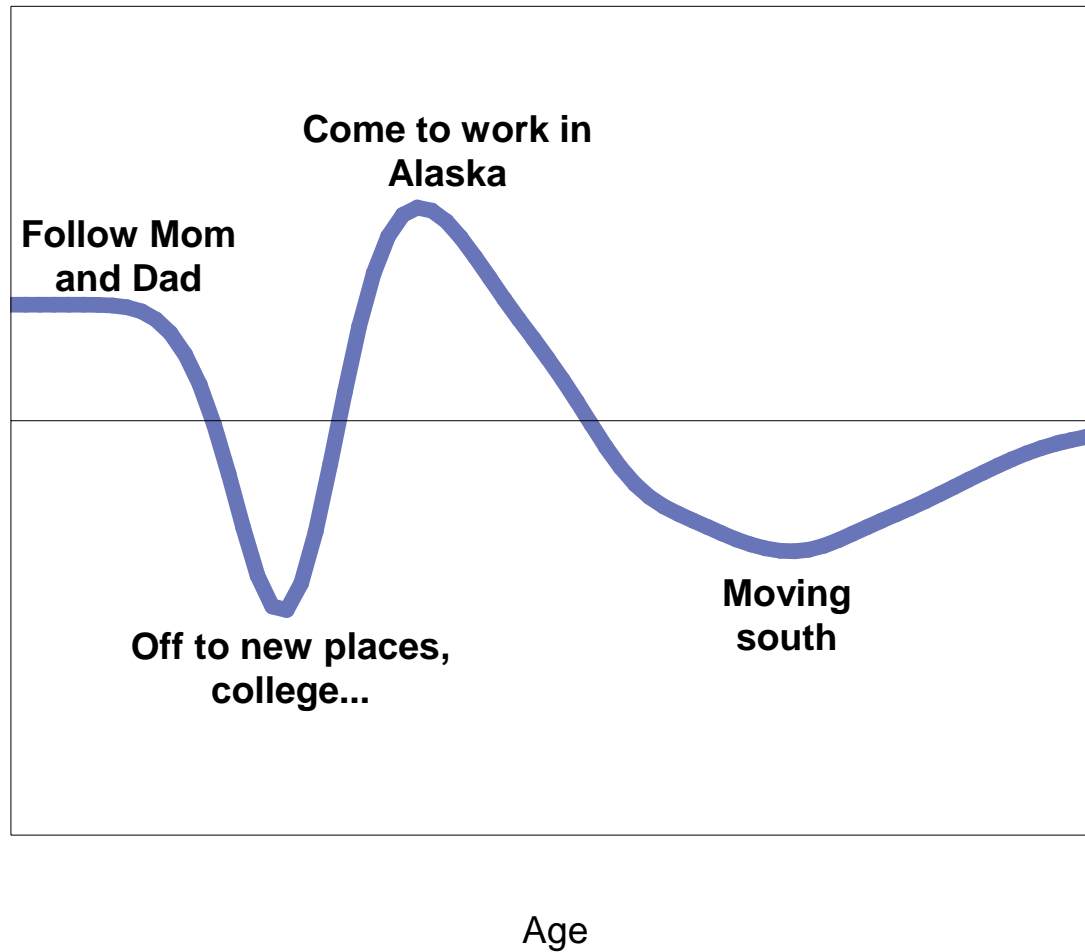
Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section

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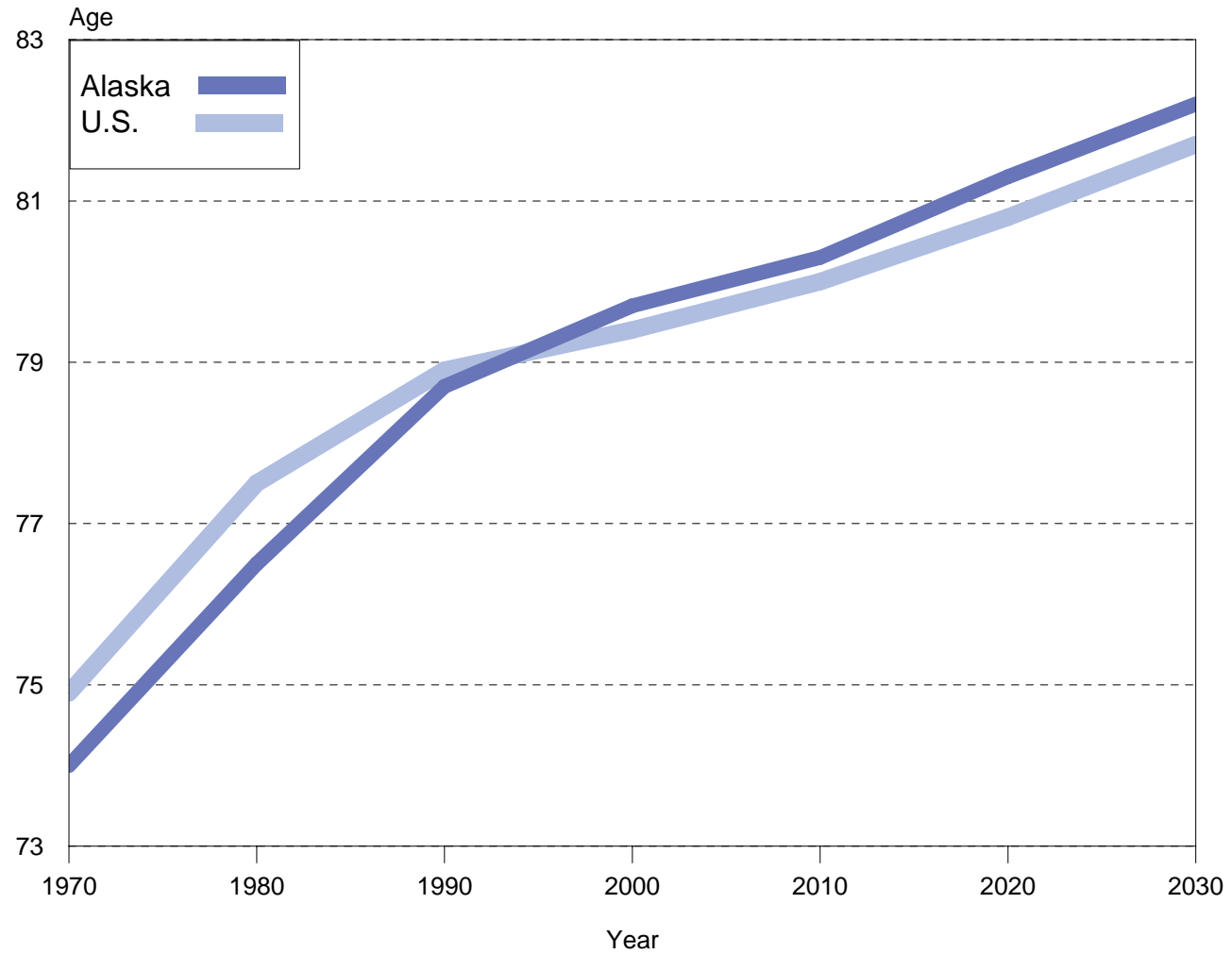
# Deaths

# Used “Brass” Alpha and Beta to Project Just a Single Path For Death Rates

Calculated the annual change (2004-2030) in Brass’ Alpha and Beta for the US SSA projected life tables.

Applied these to 2004 Alaska life tables.

## Female Life Expectancy at Birth, Alaska and the United States 1970-2000 Estimated, 2010-2030 Projected

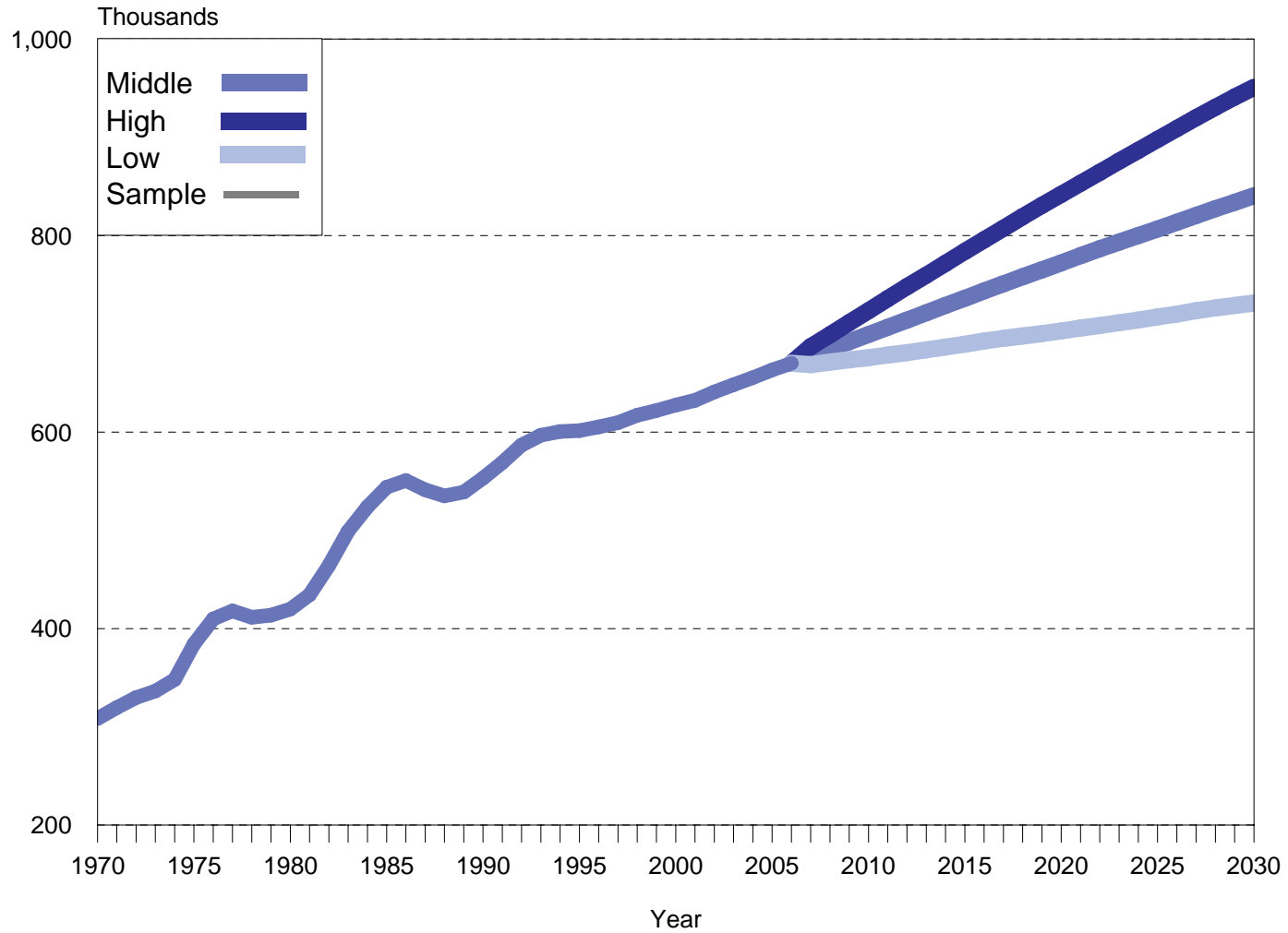


Sources: Alaska Department of Labor & Workforce Development, Research and Analysis Section  
and U.S. Social Security Administration

# Statewide Results

# Alaska's Total Population

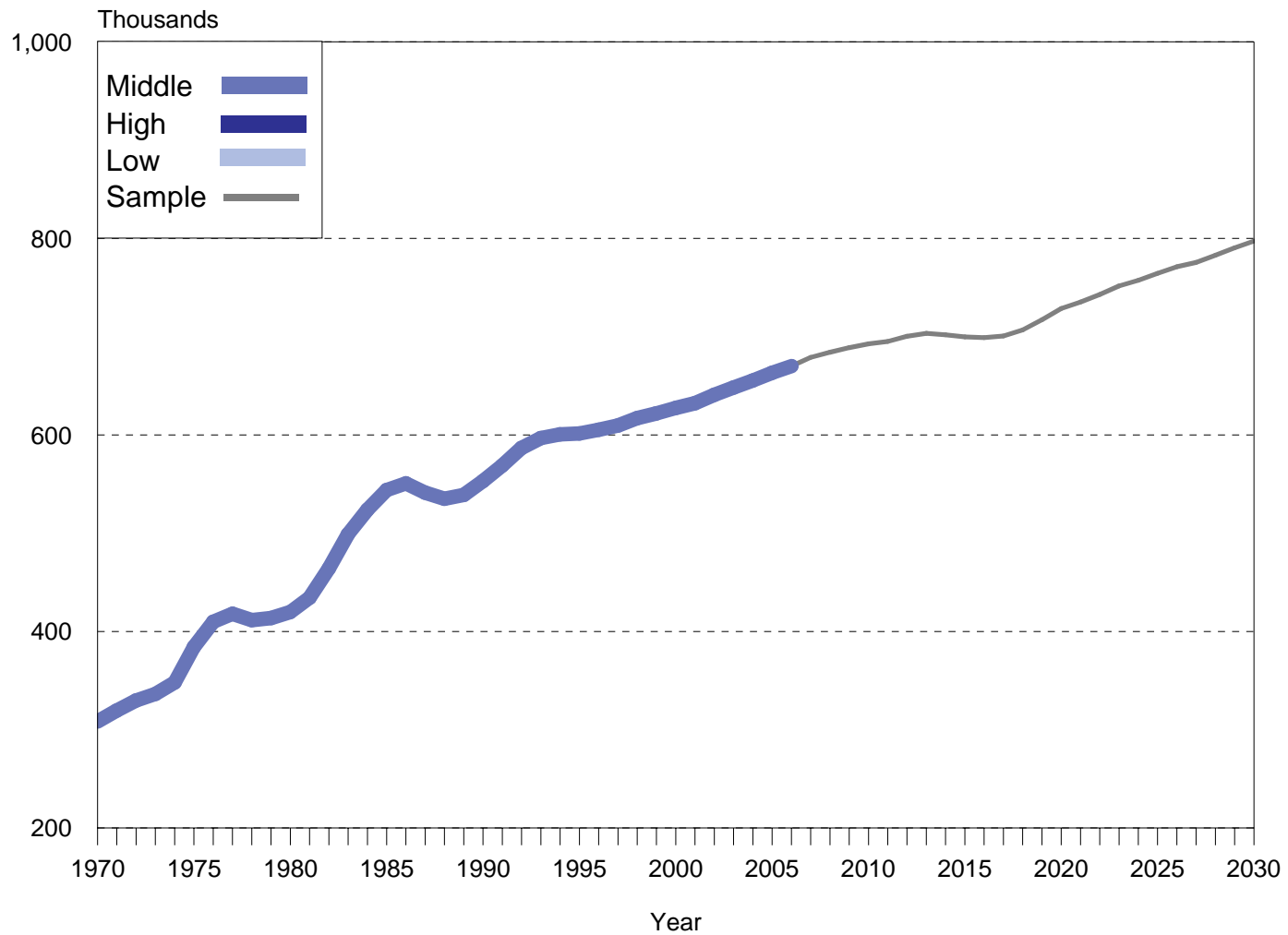
## 1970-2006 Estimated, 2007-2030 Projected



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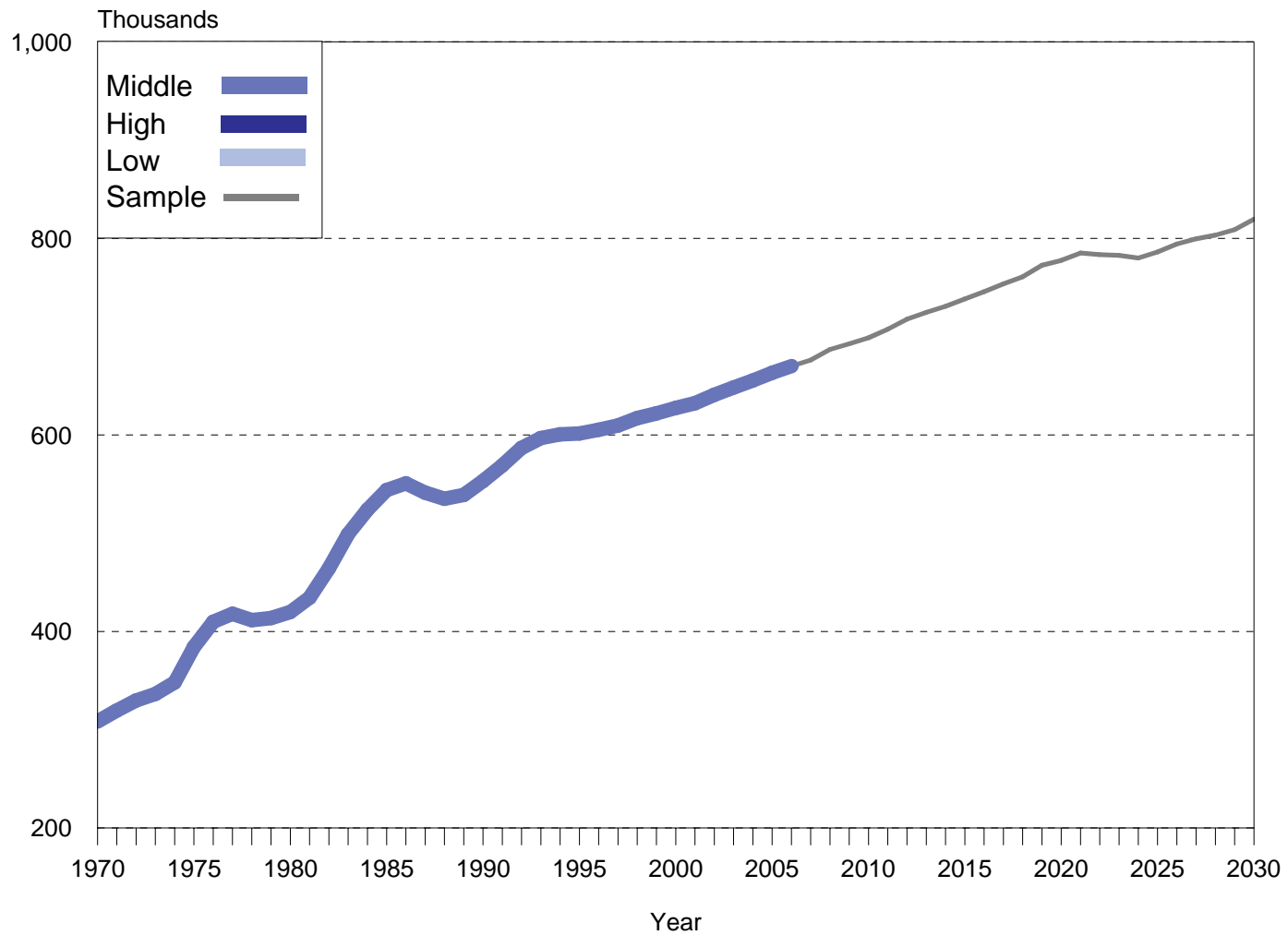
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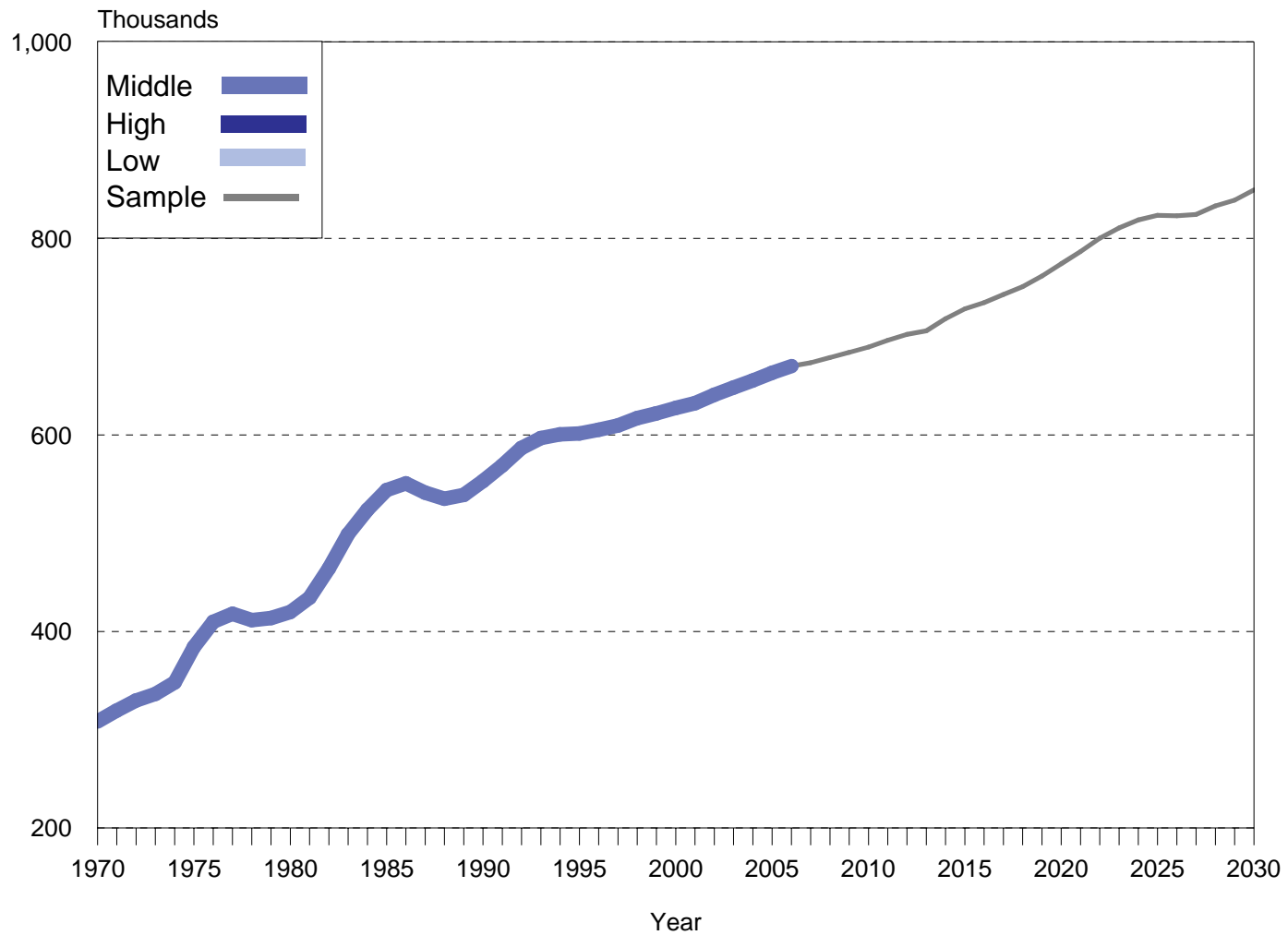
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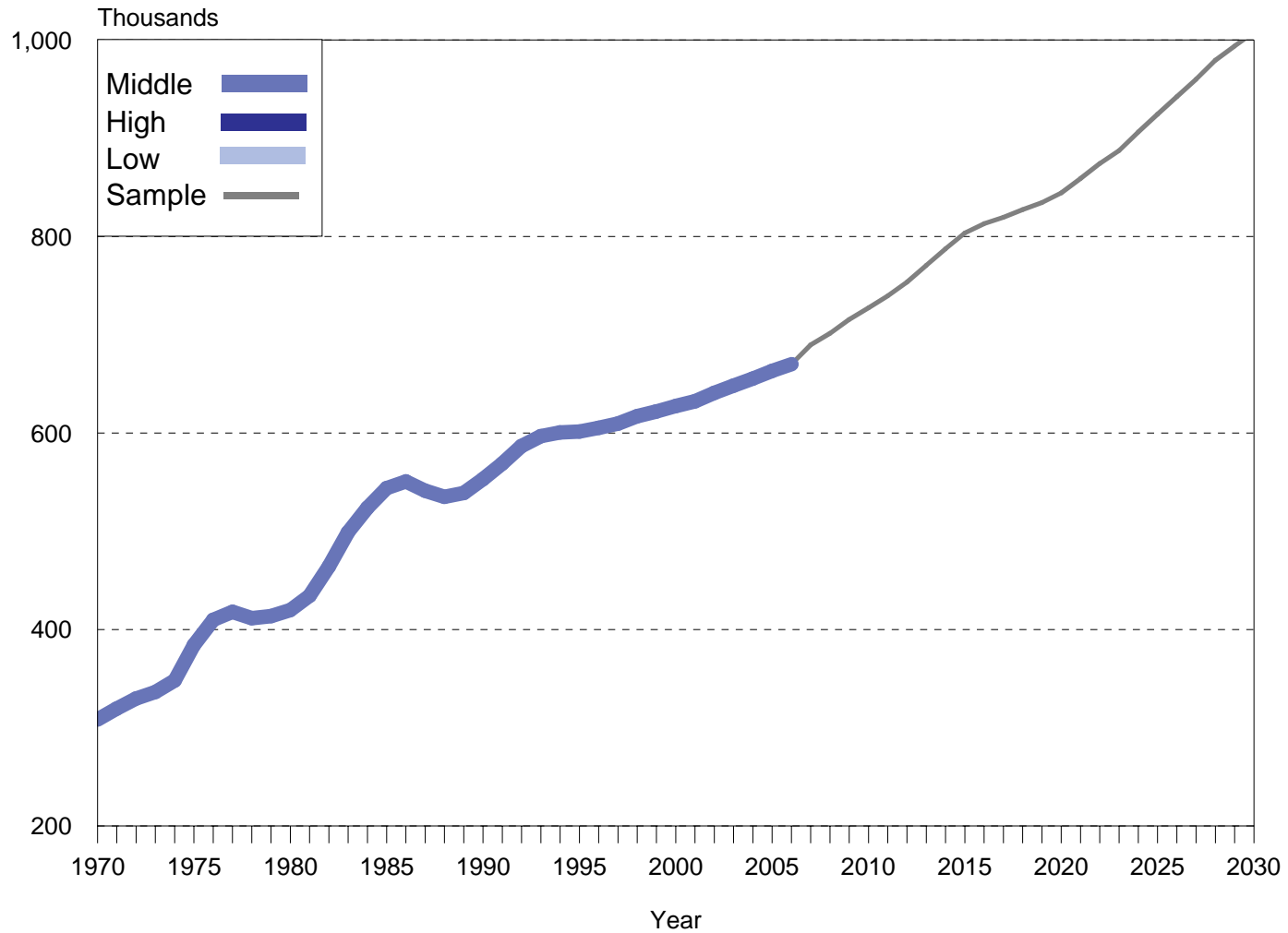
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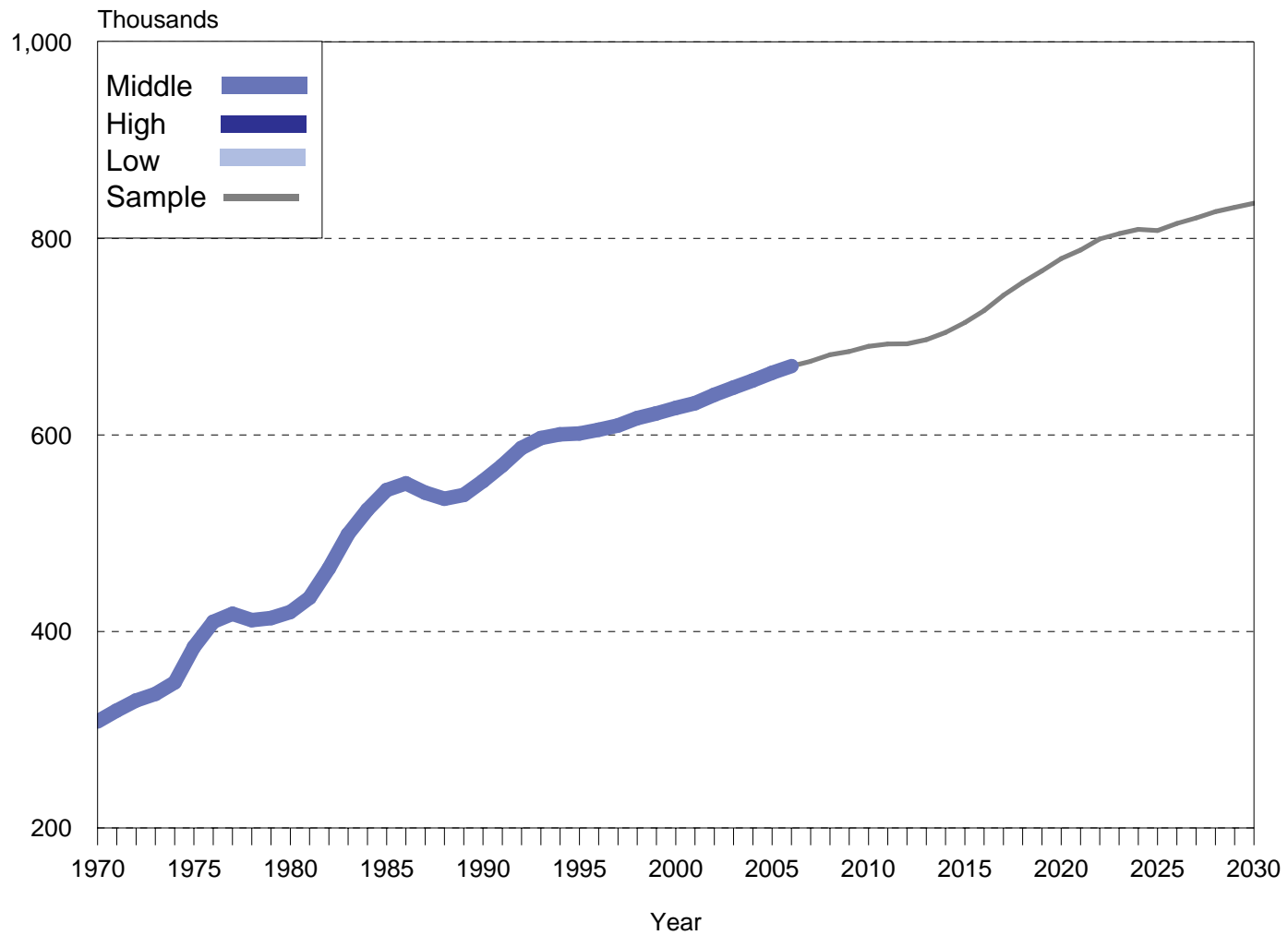
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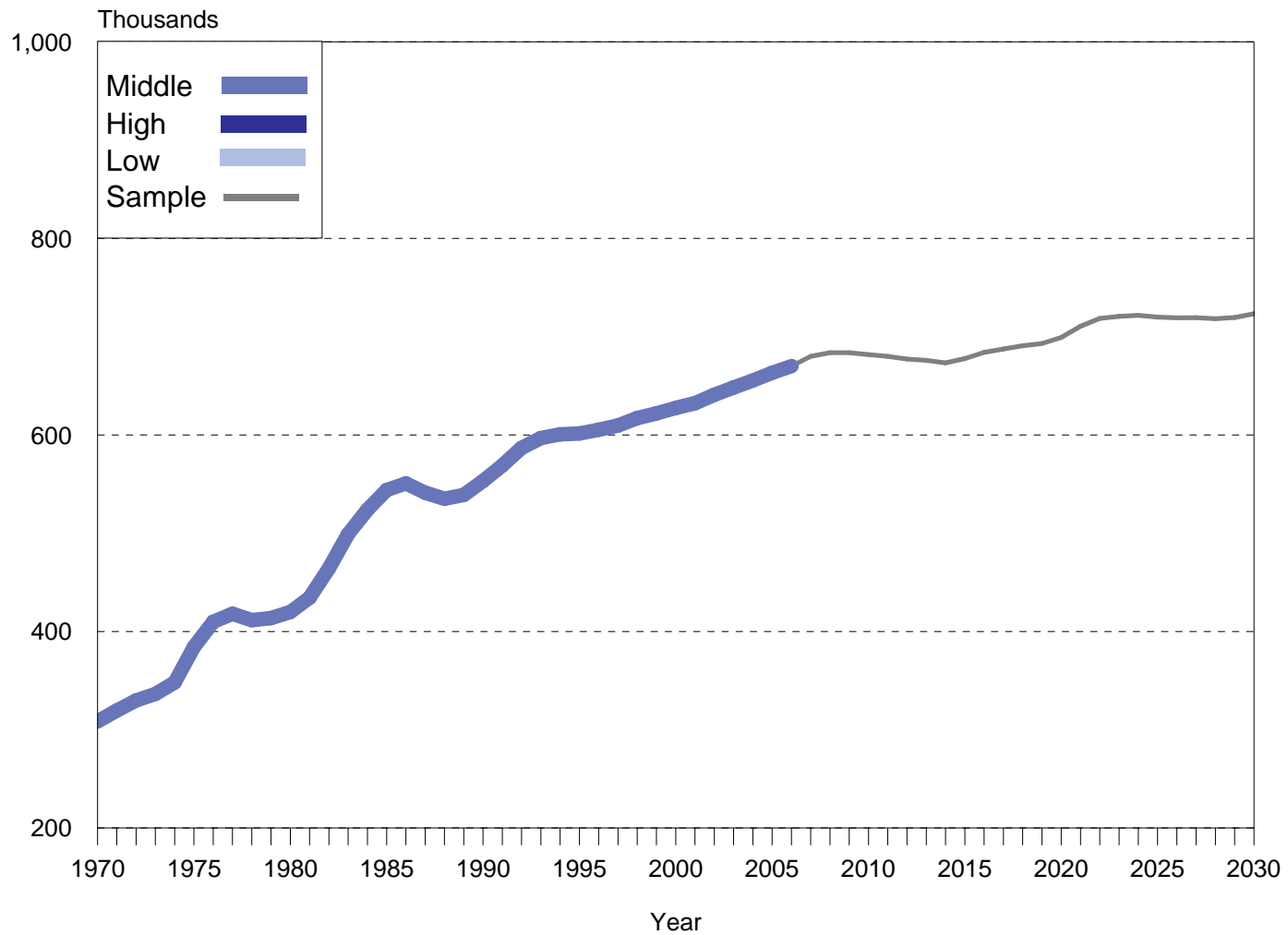
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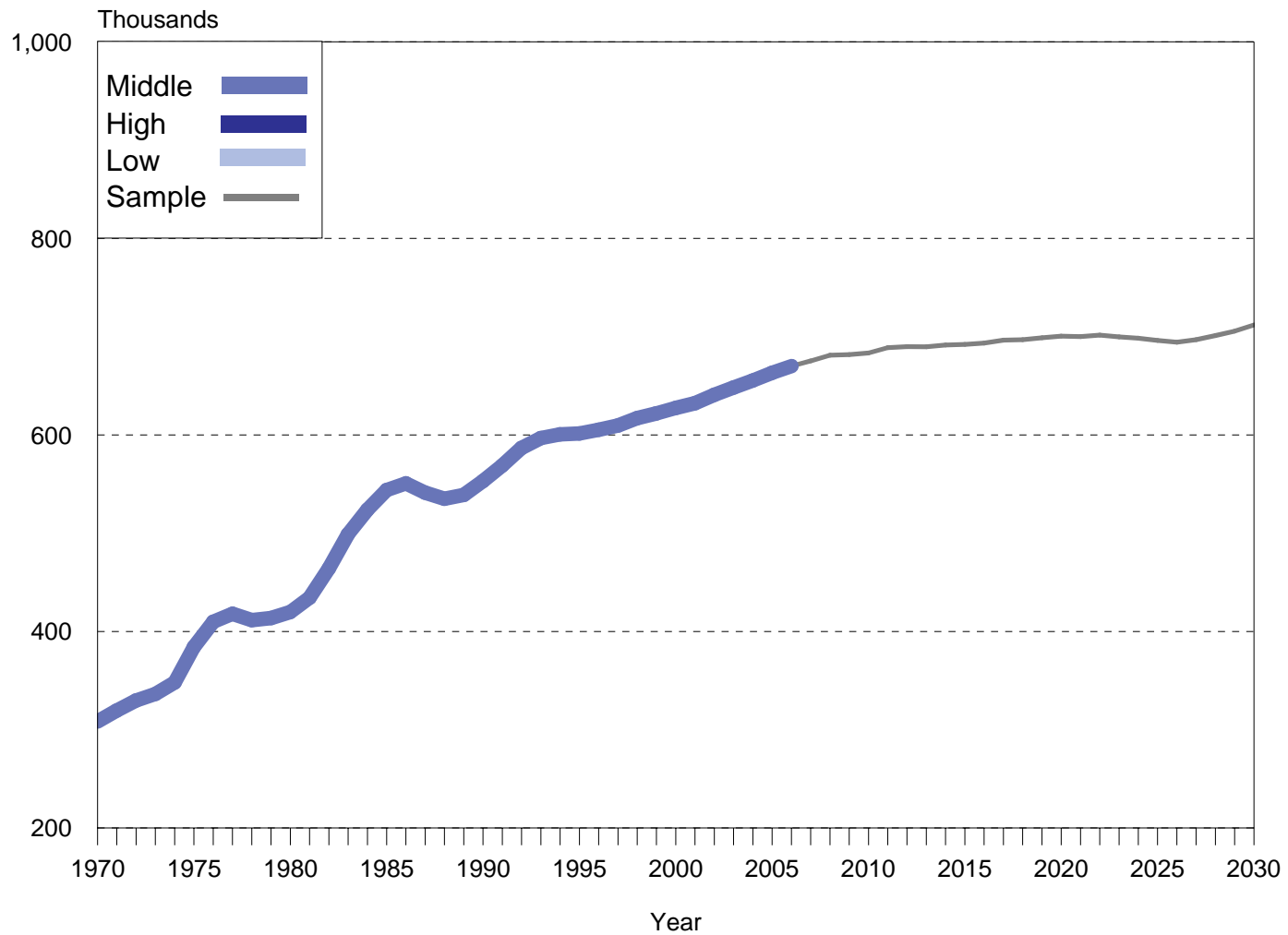
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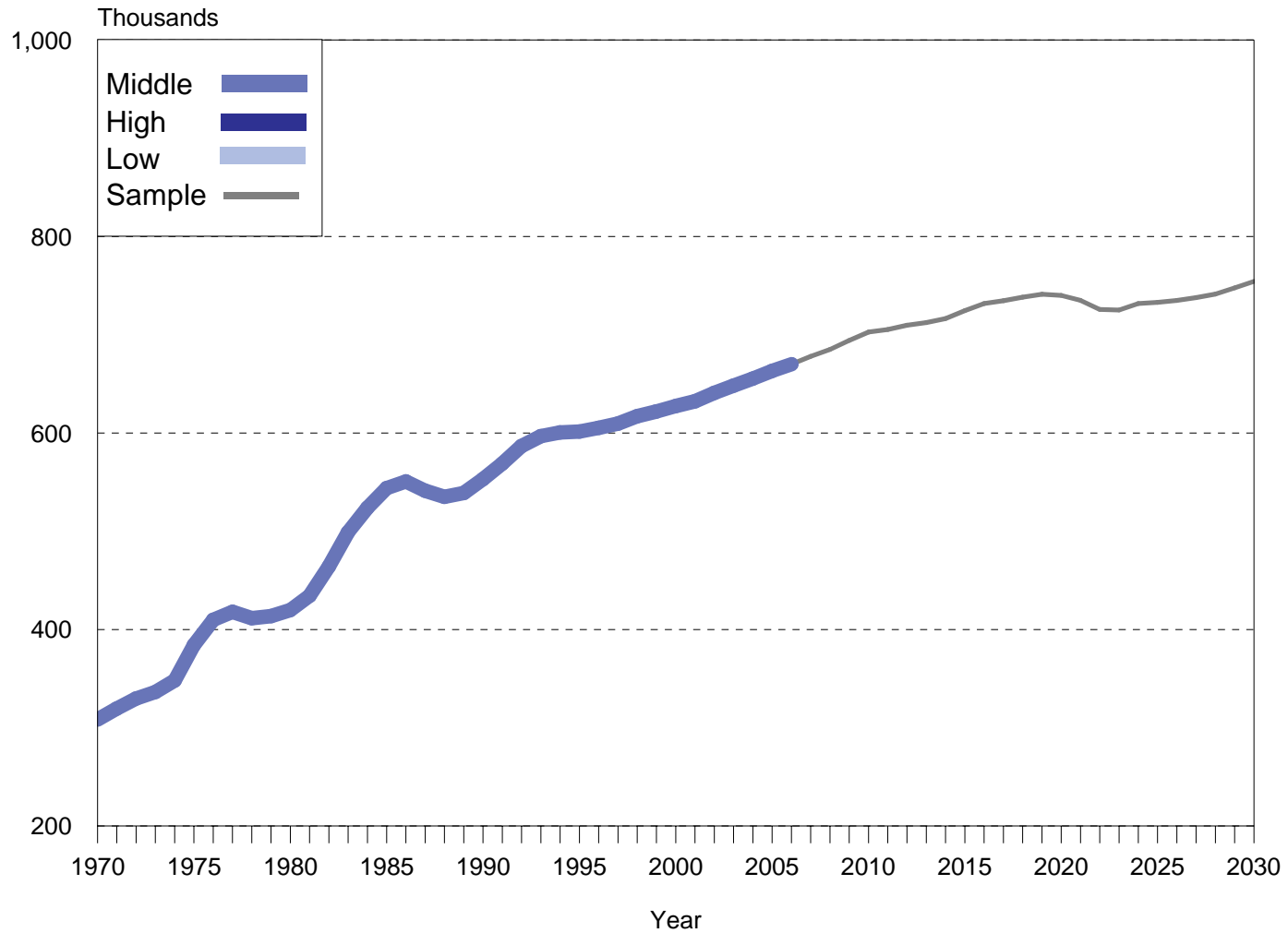
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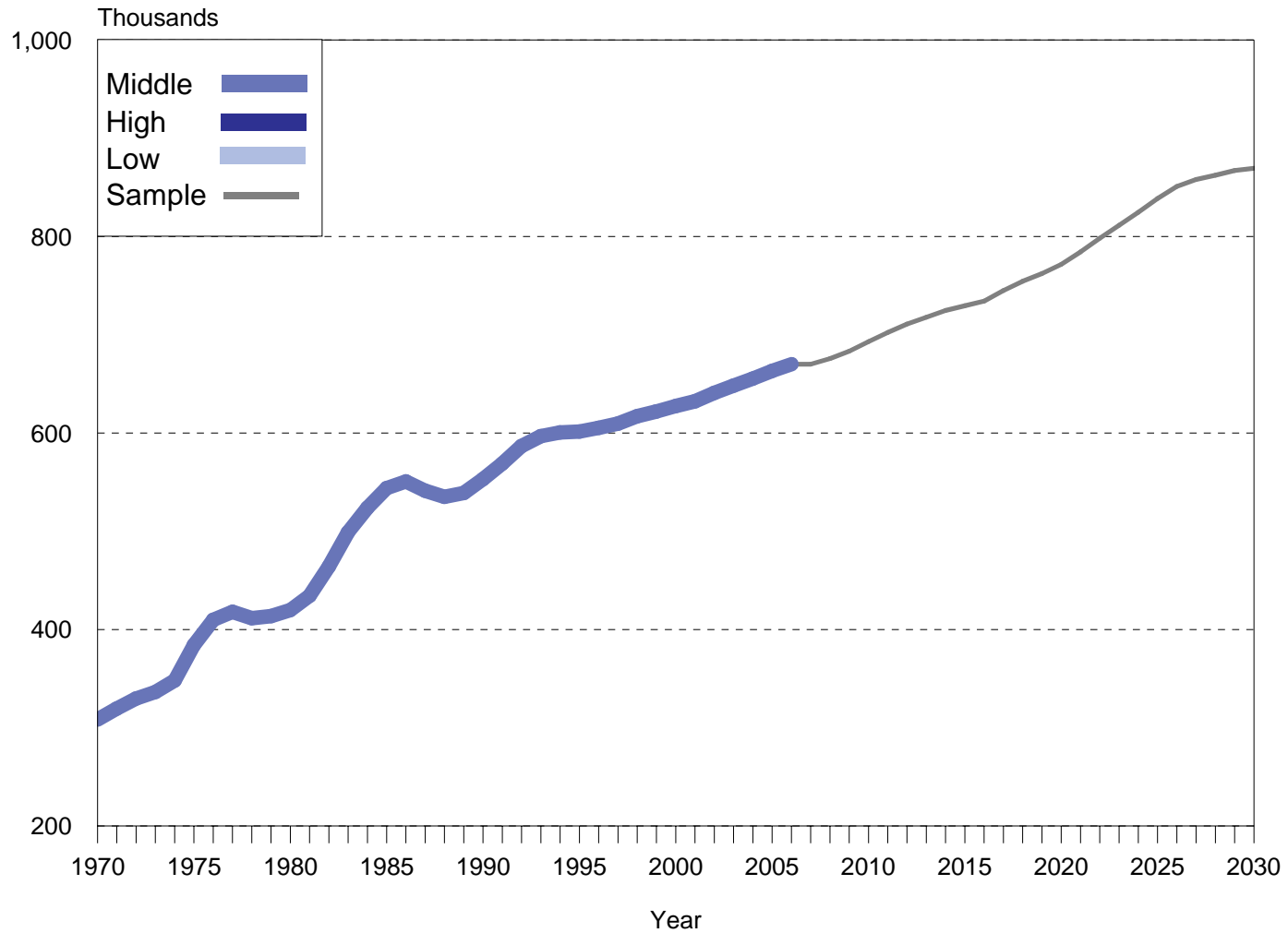
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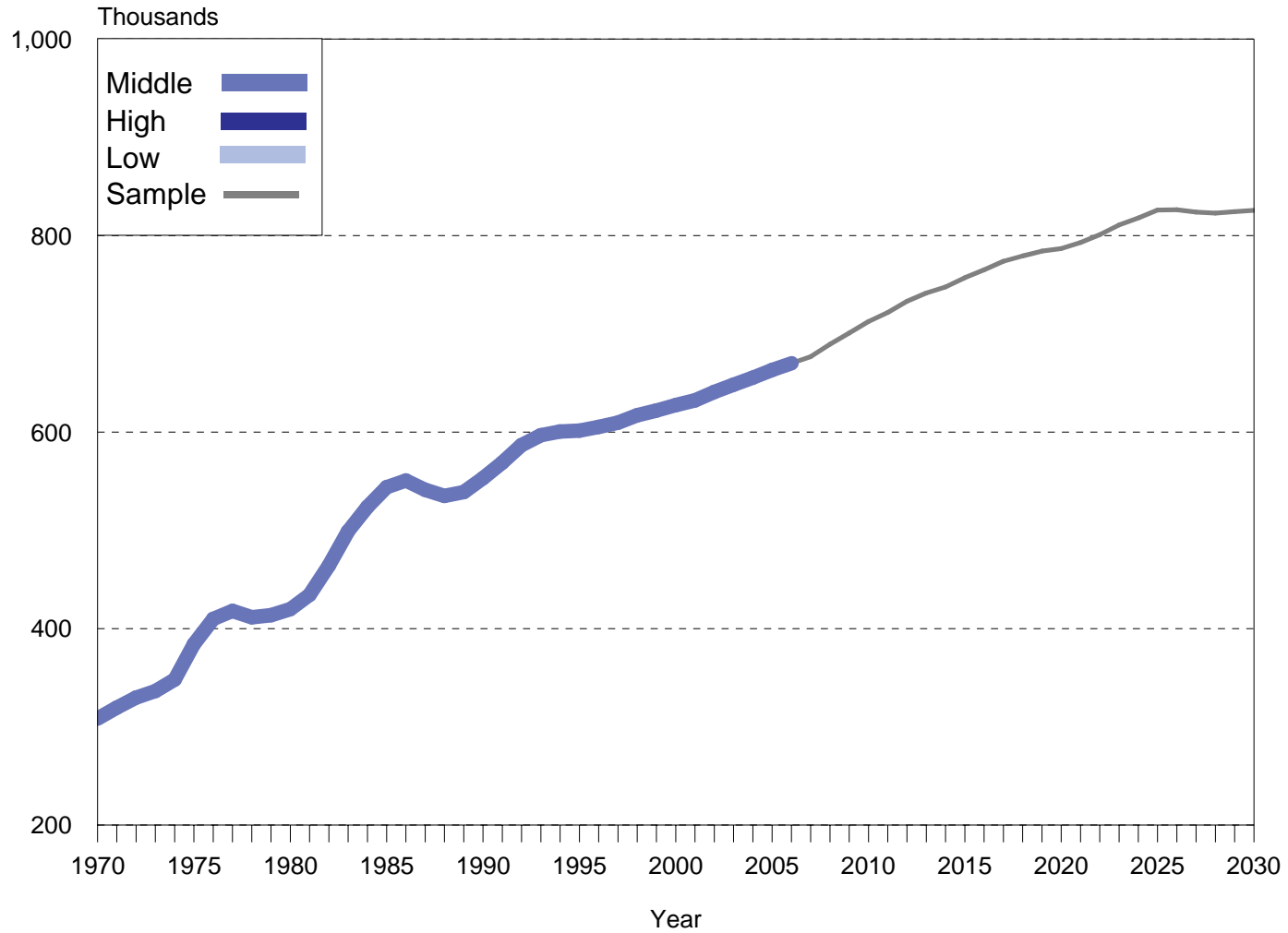
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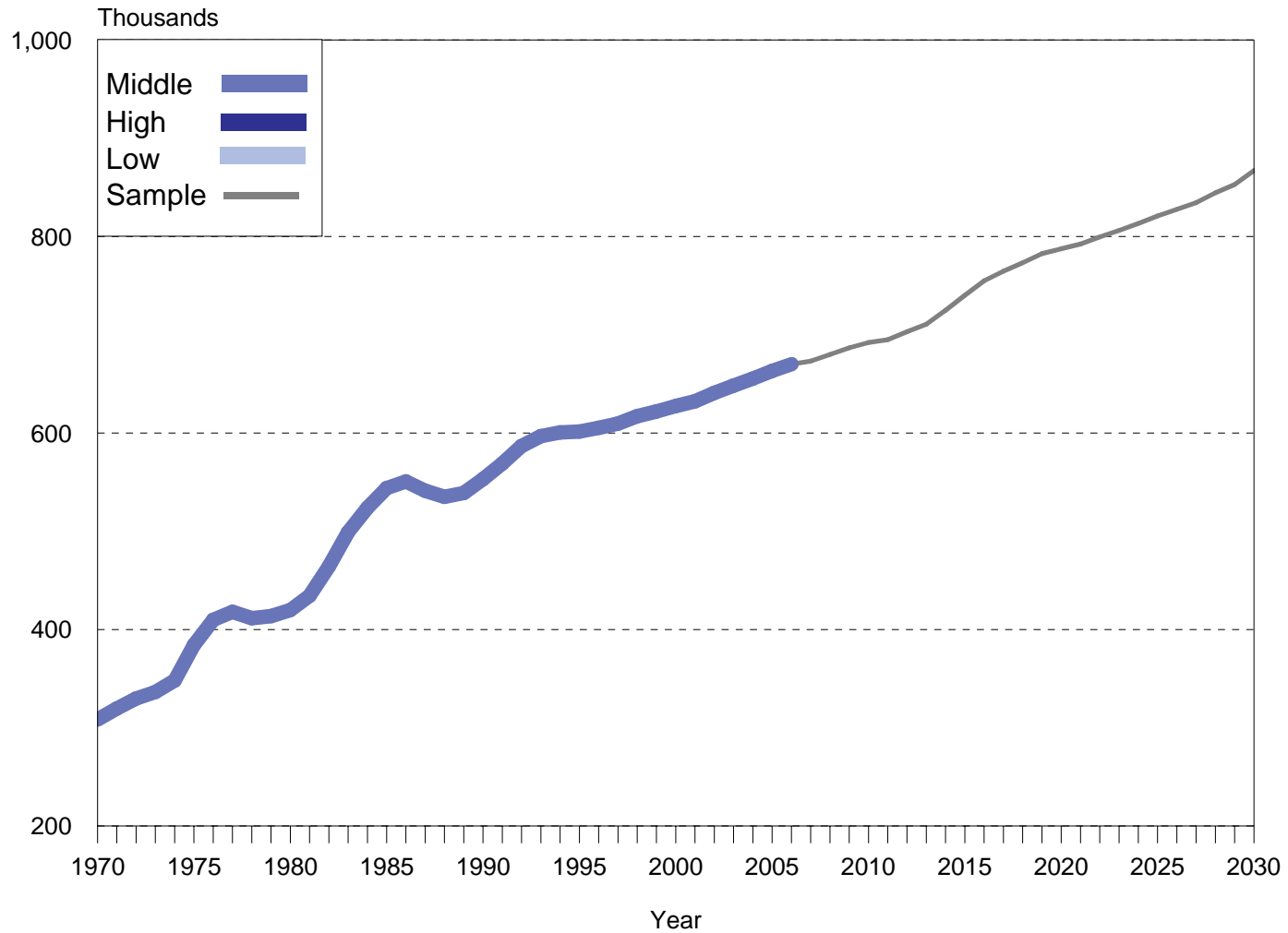
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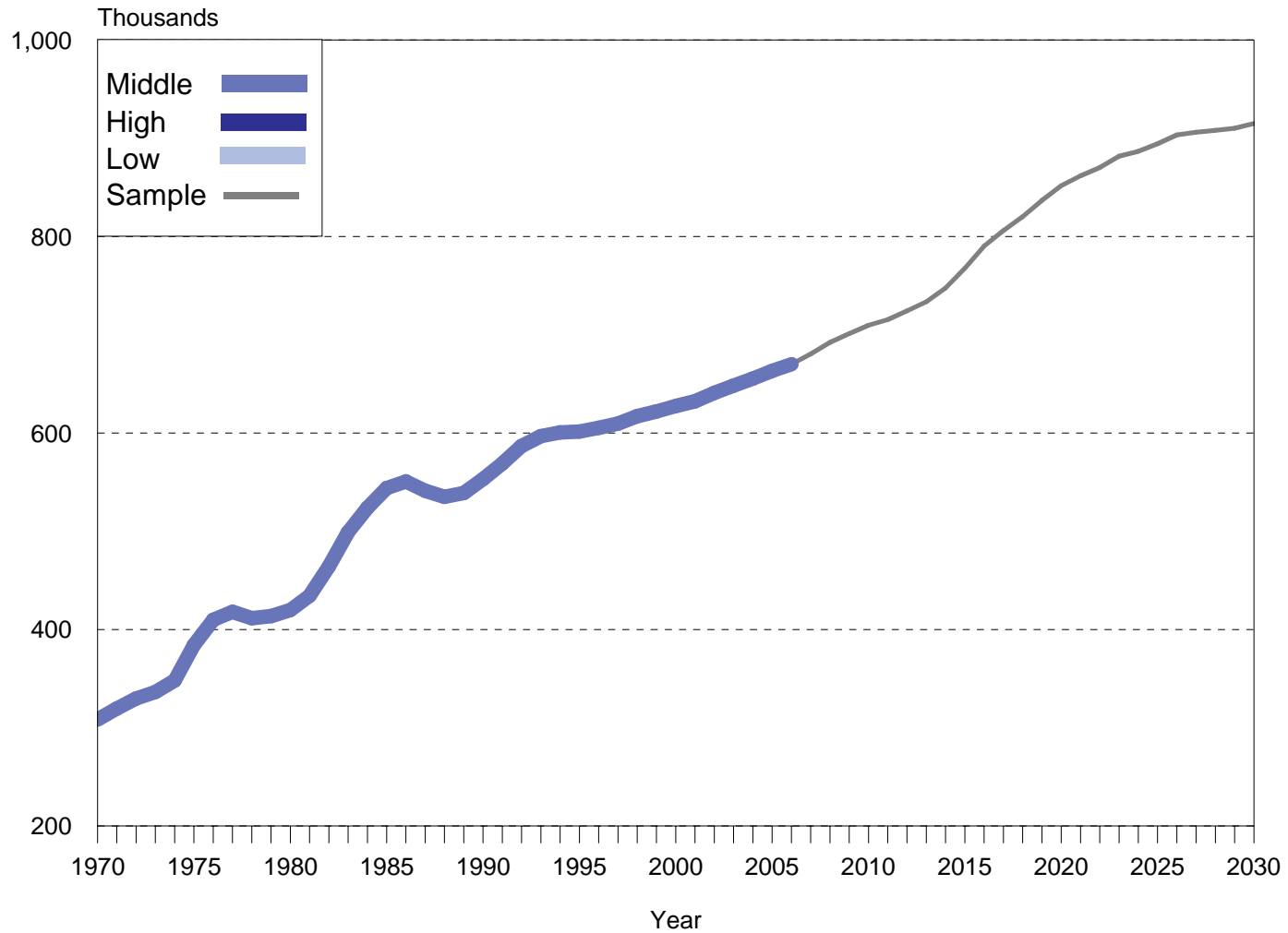
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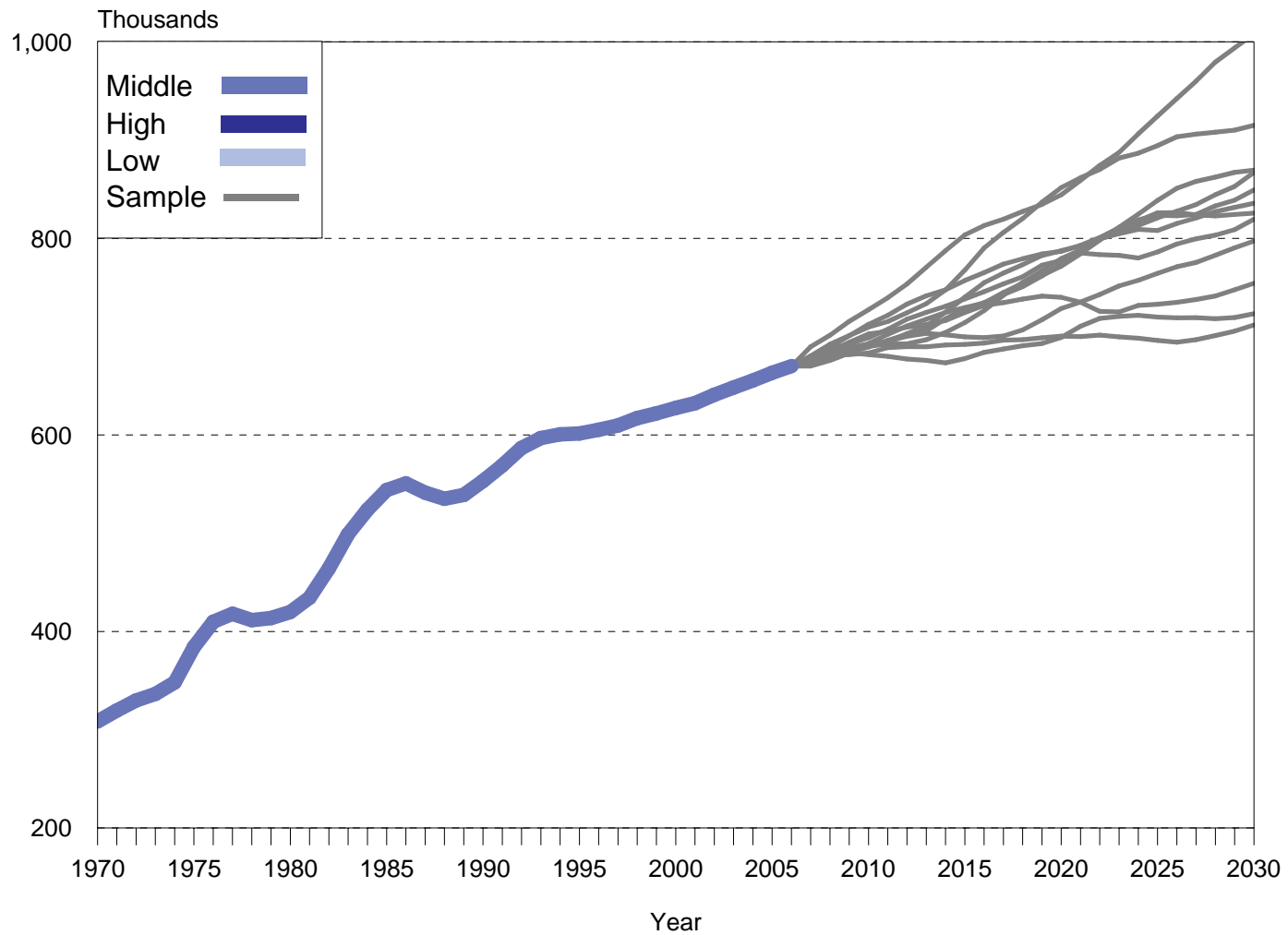
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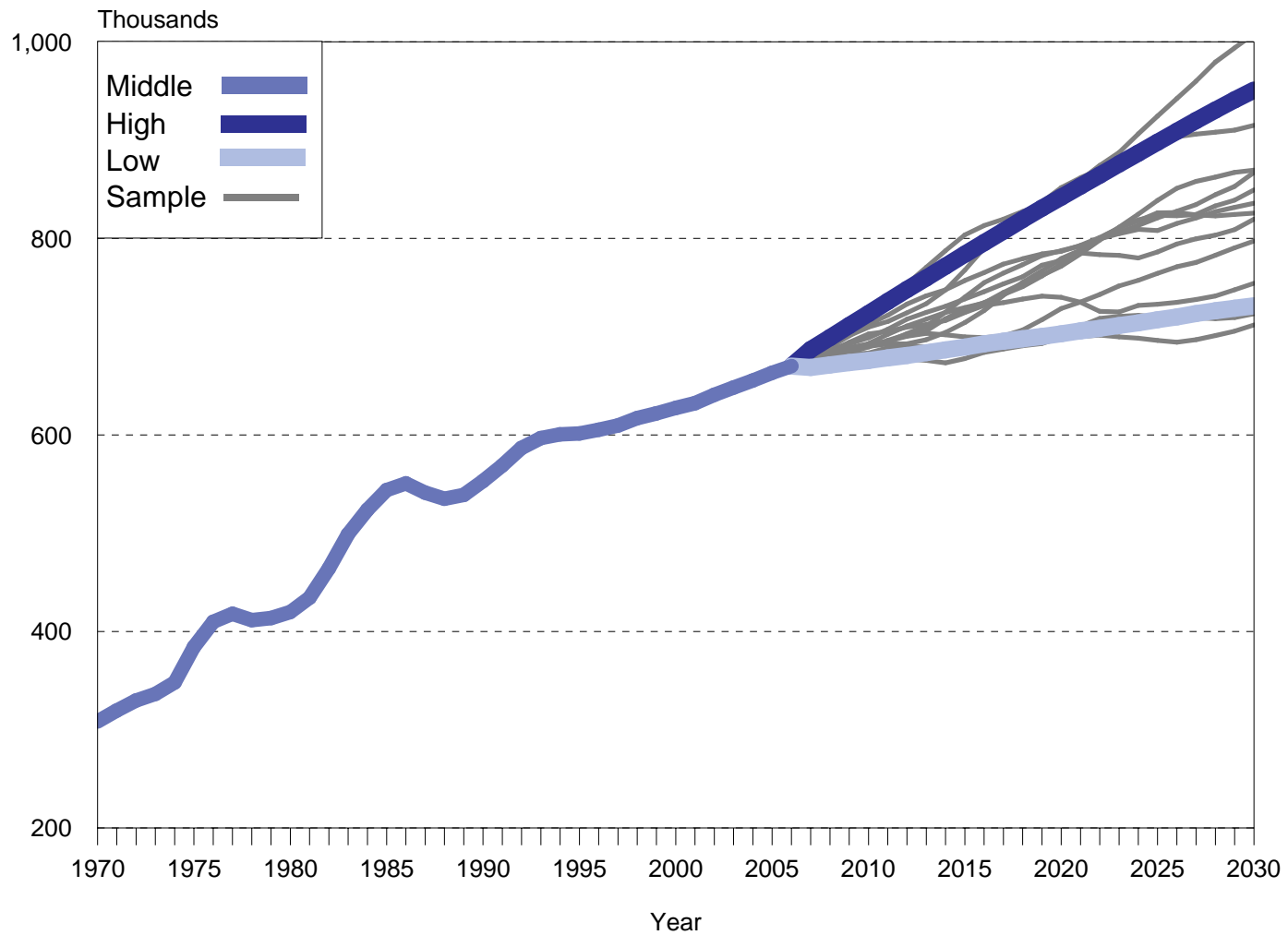
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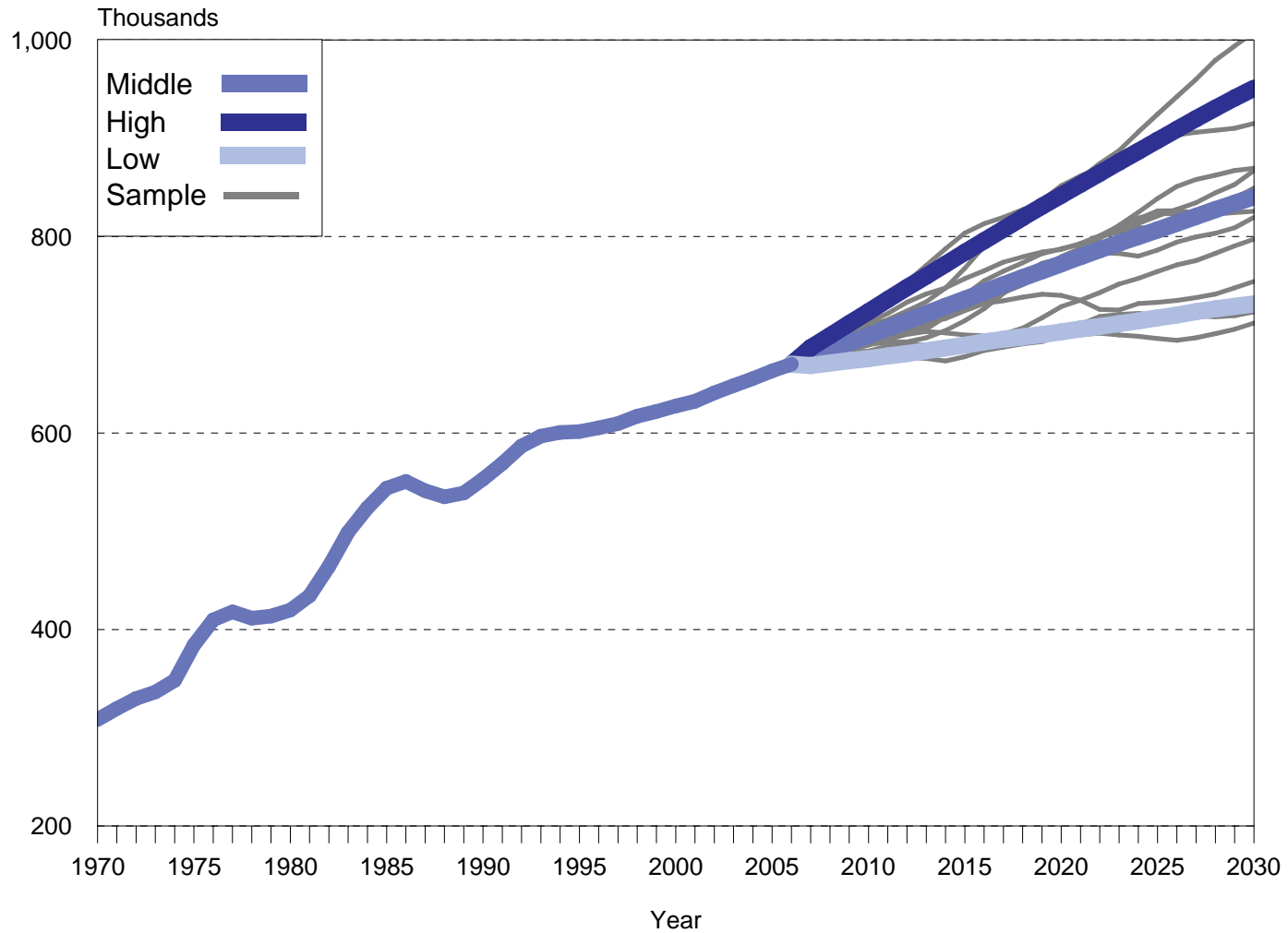
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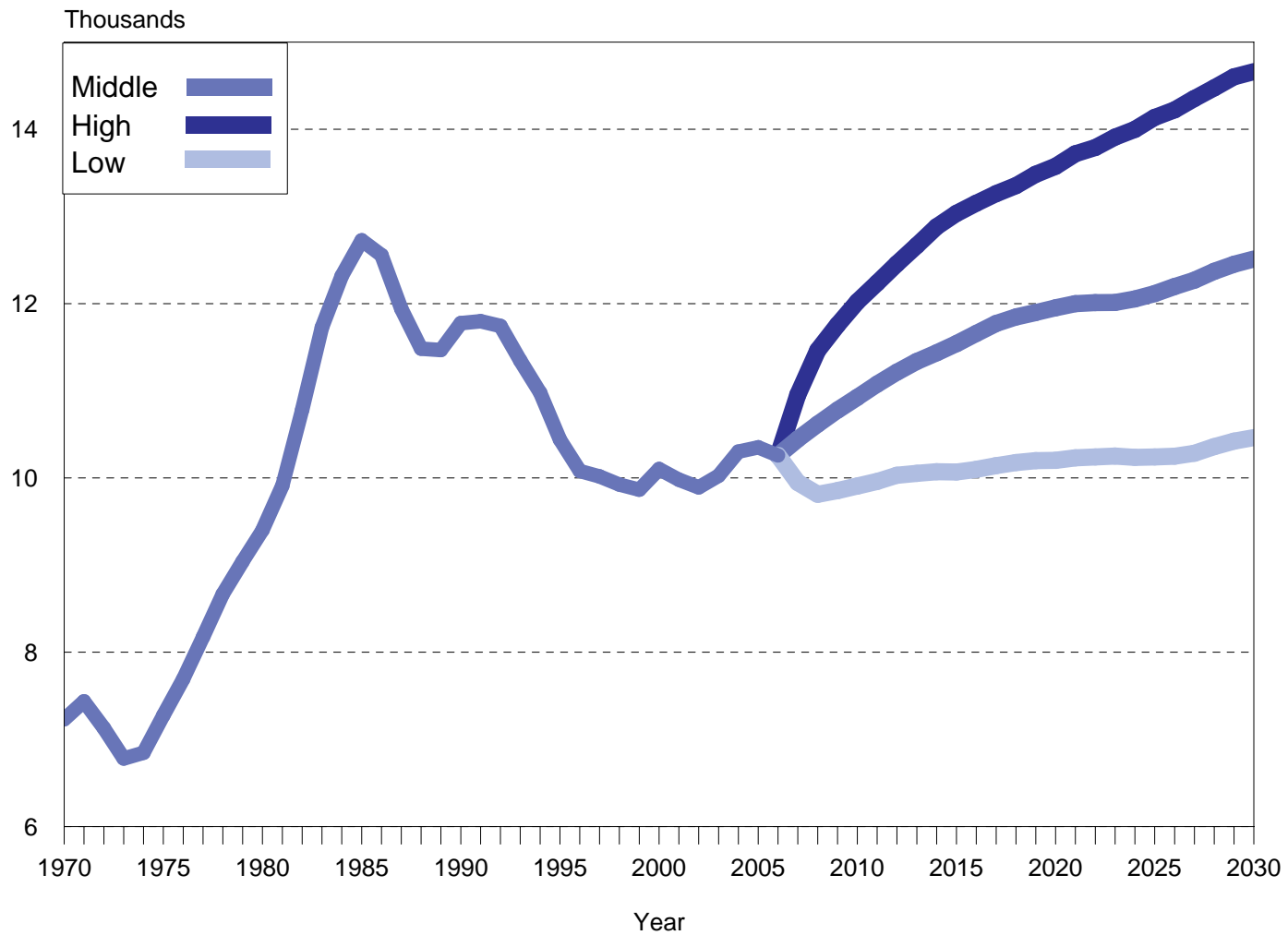
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 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Births

## 1970-2006 Estimated, 2007-2030 Projected

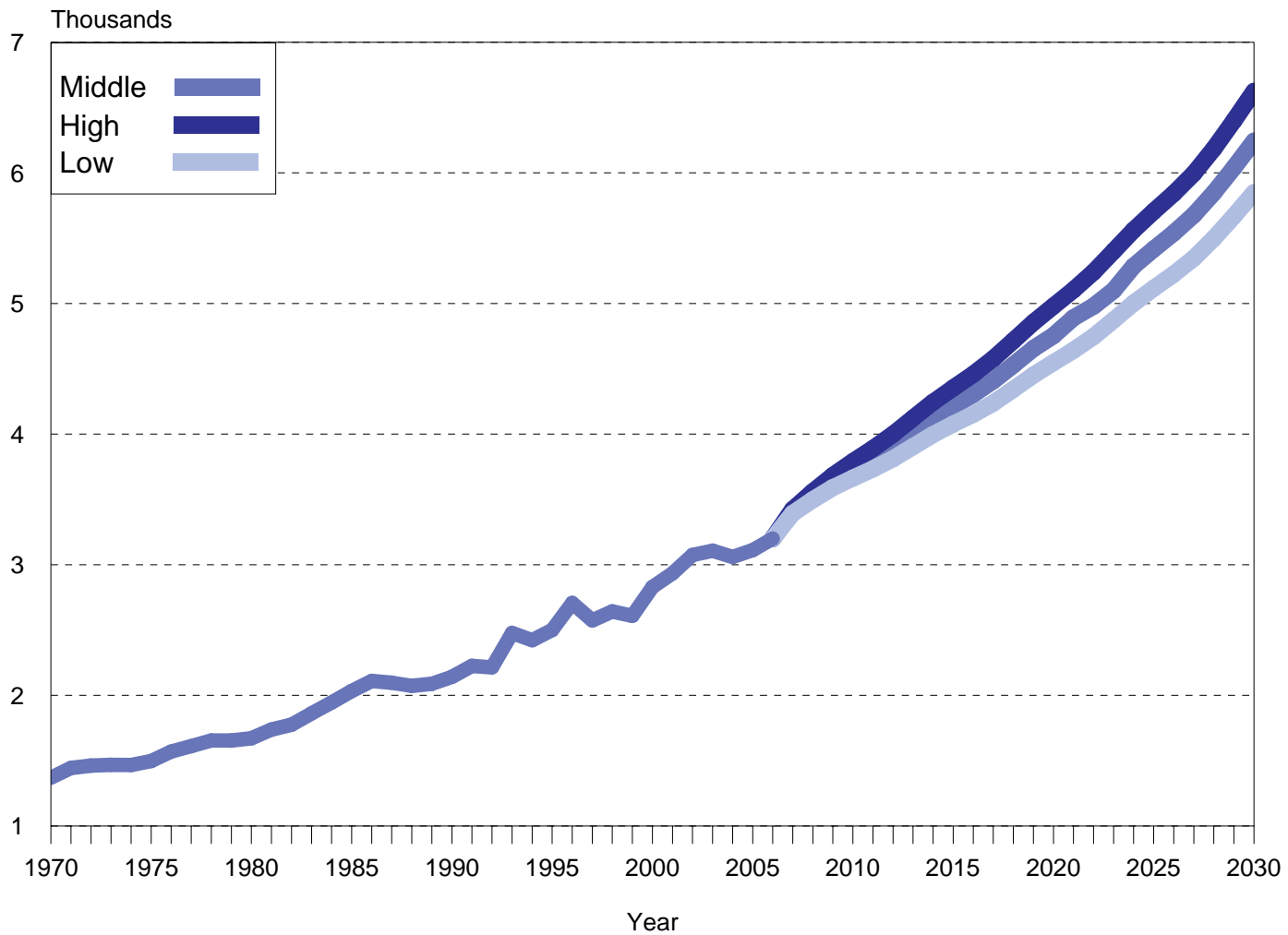


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# Alaska Deaths

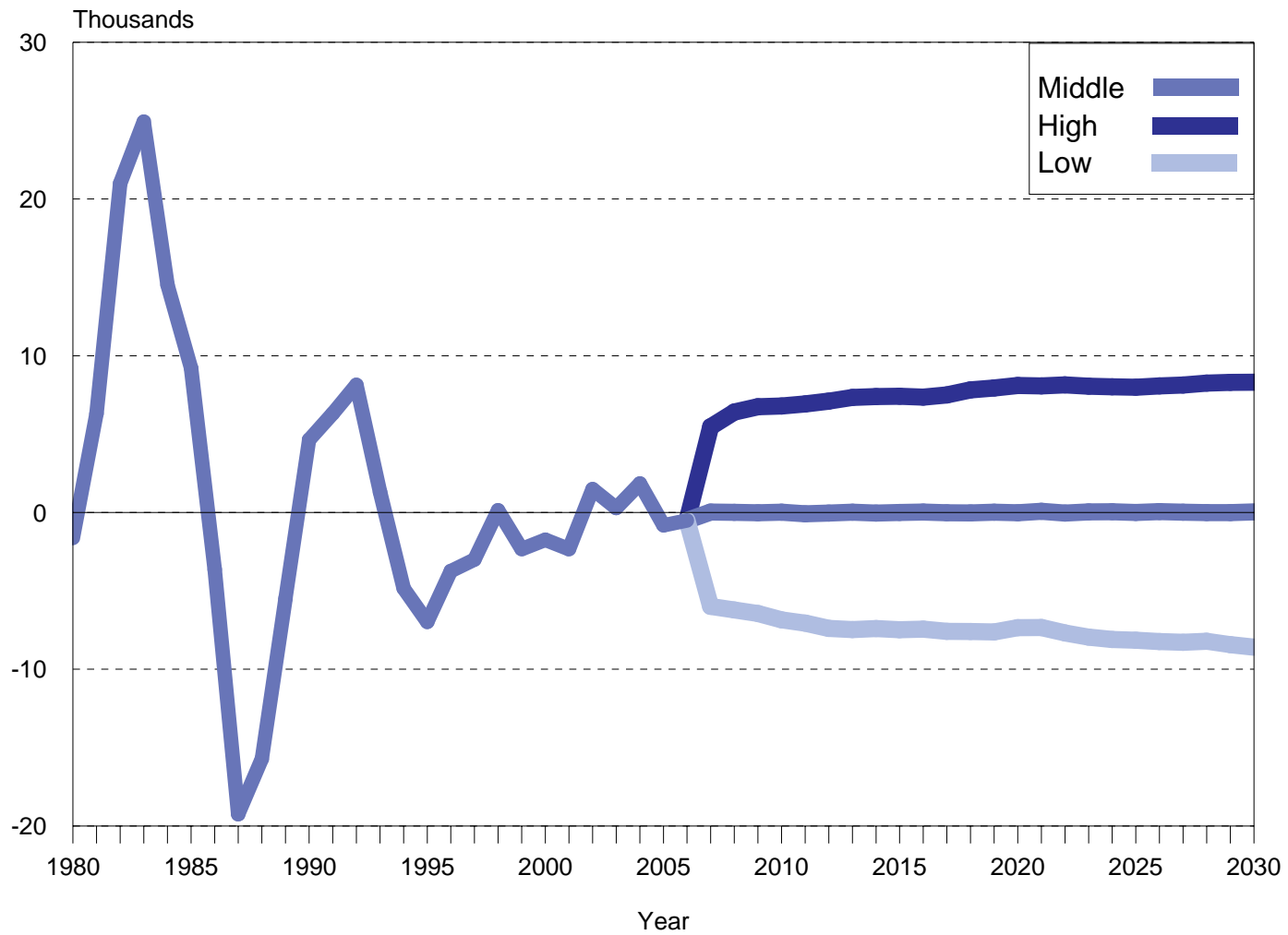
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 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Net Migration

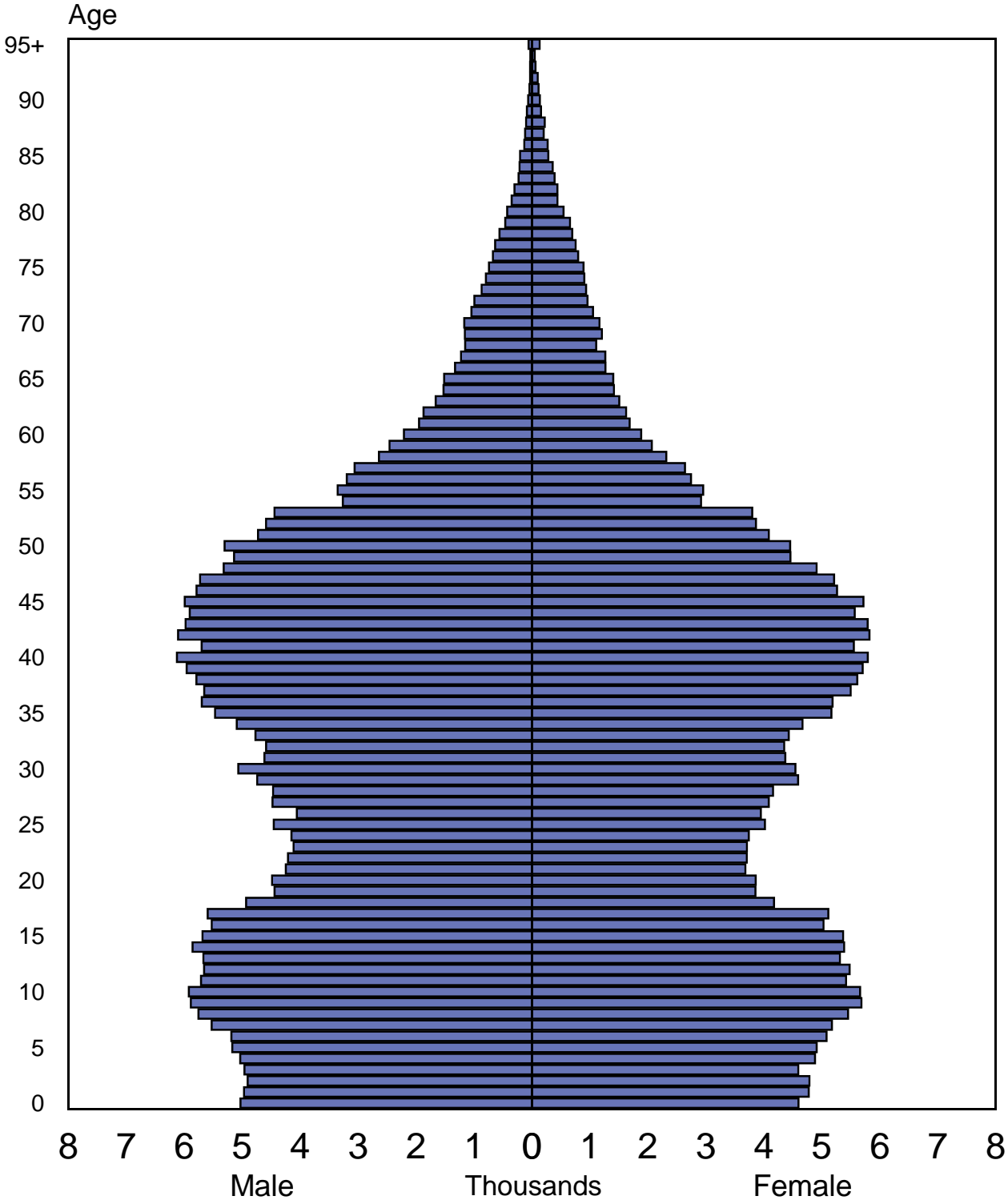
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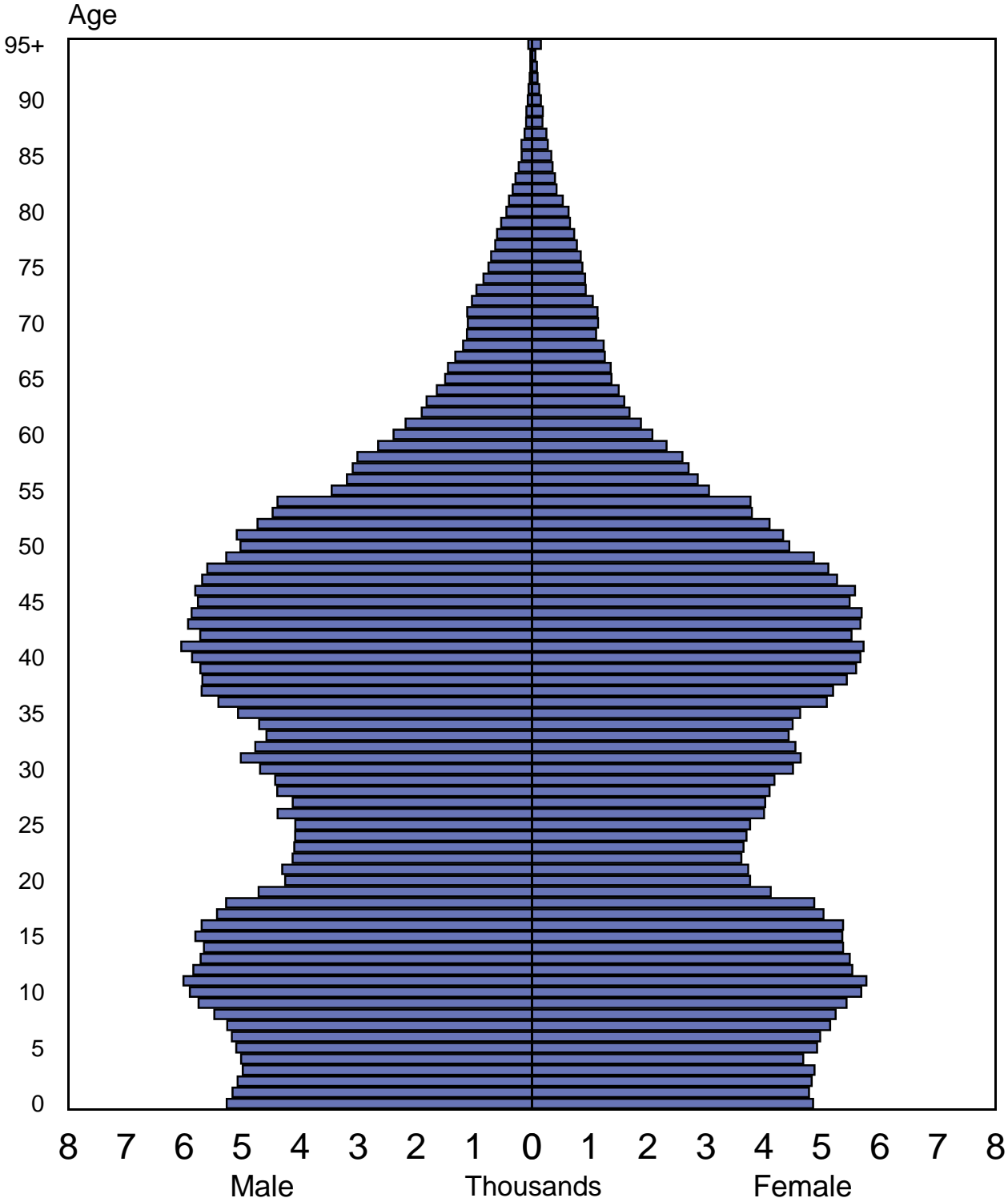
# Projected Population Pyramids

# Alaska Estimated Population by Age and Sex, 2000



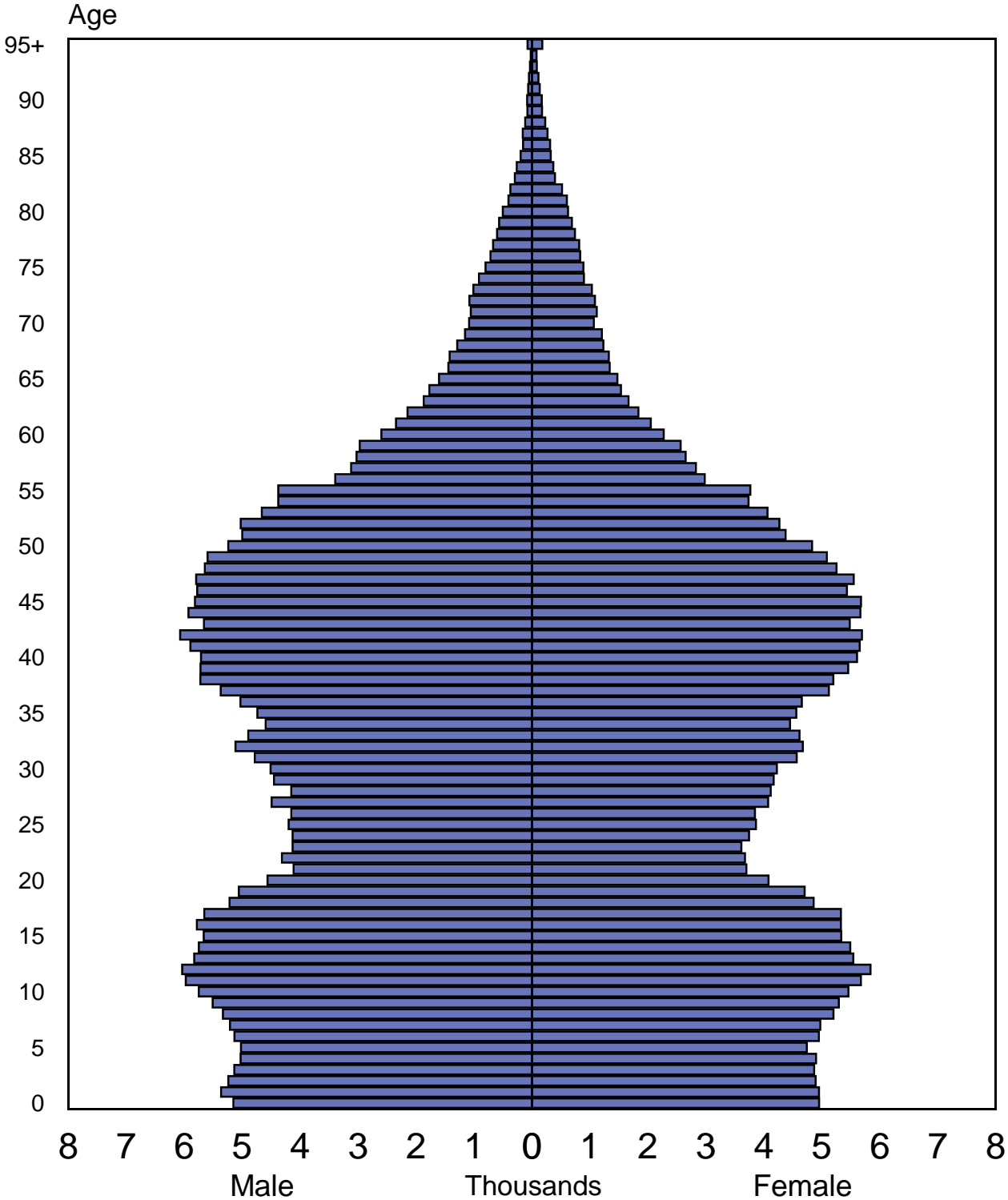
Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Estimated Population by Age and Sex, 2001



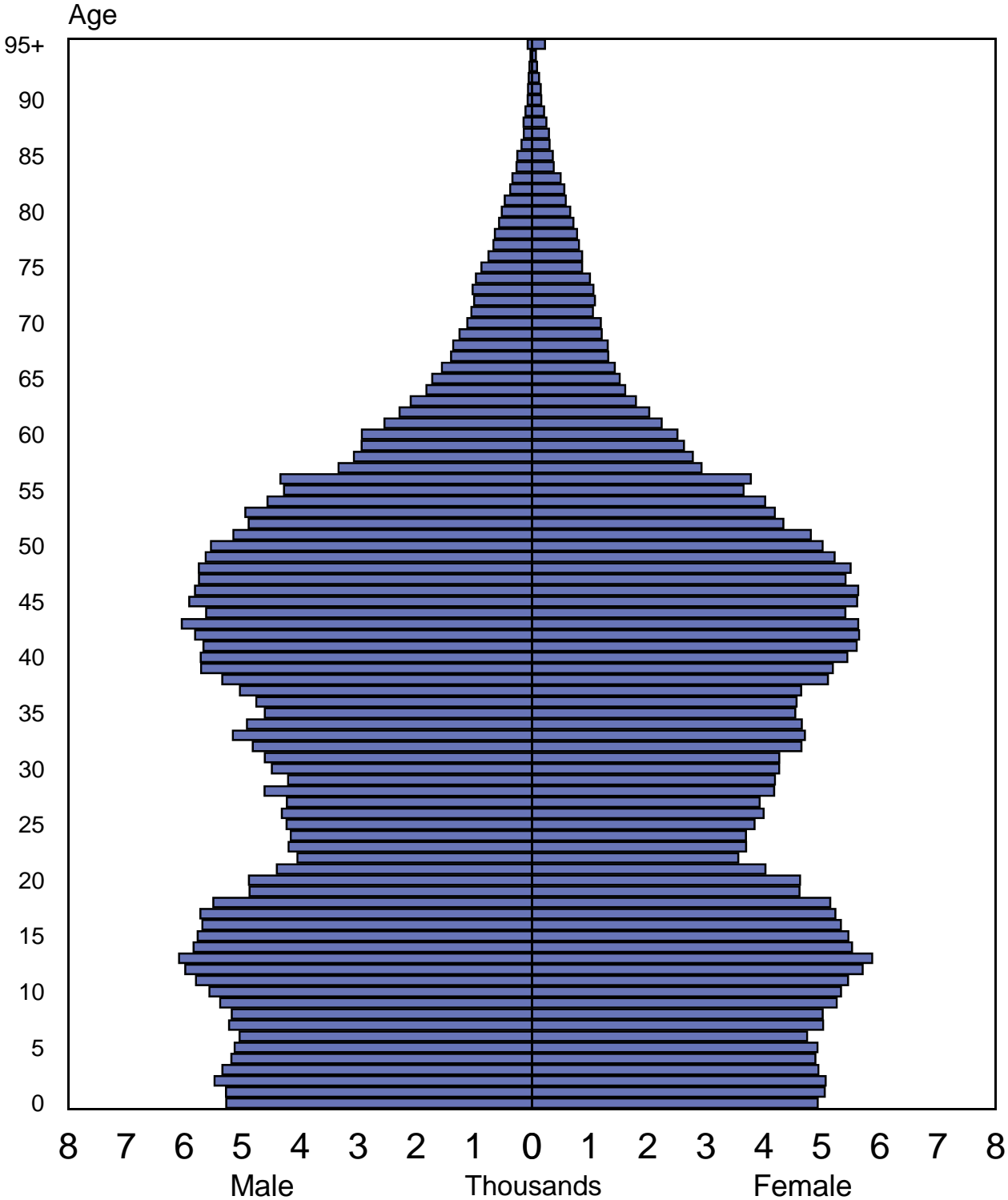
Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Estimated Population by Age and Sex, 2002



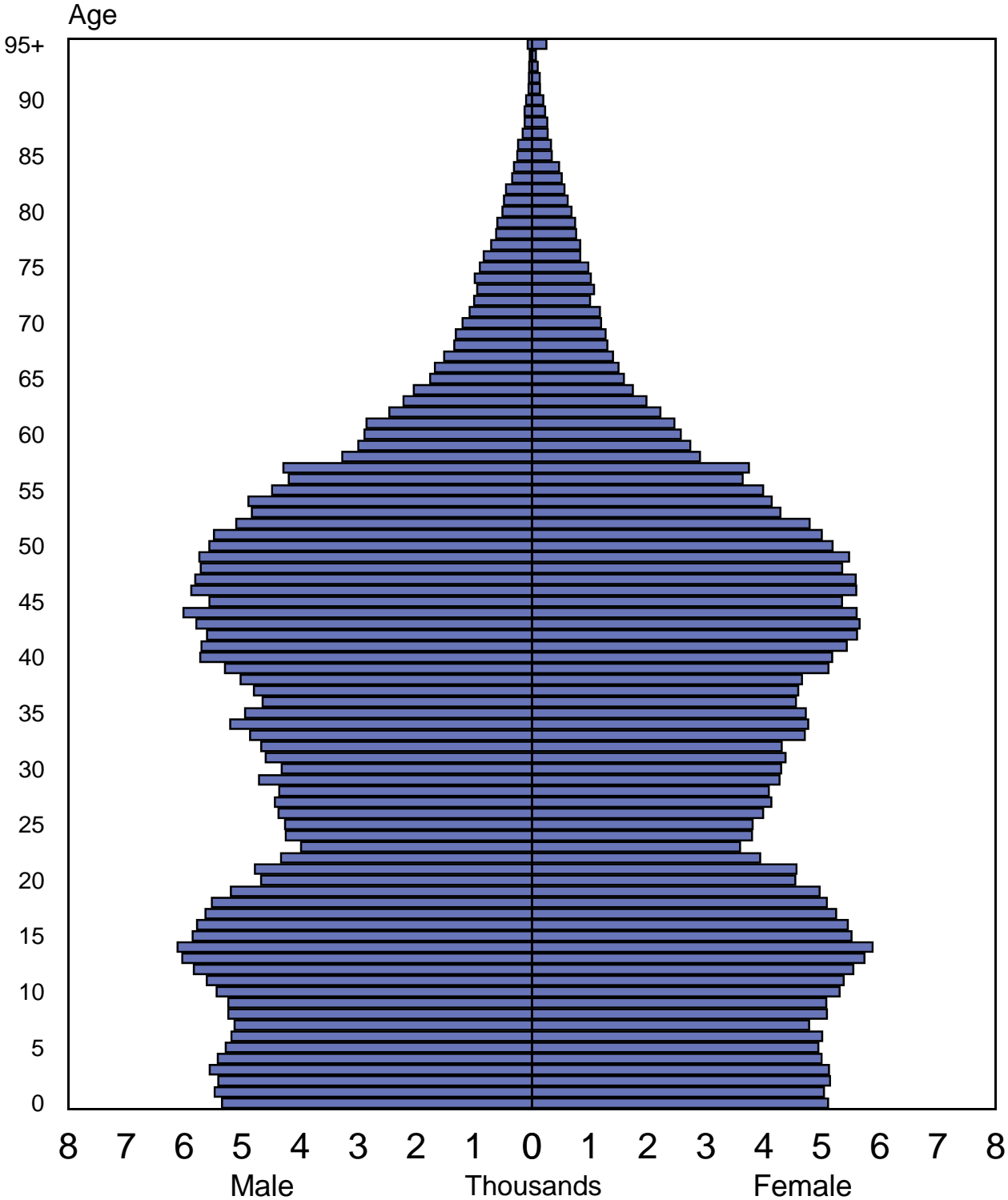
Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Estimated Population by Age and Sex, 2003



Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

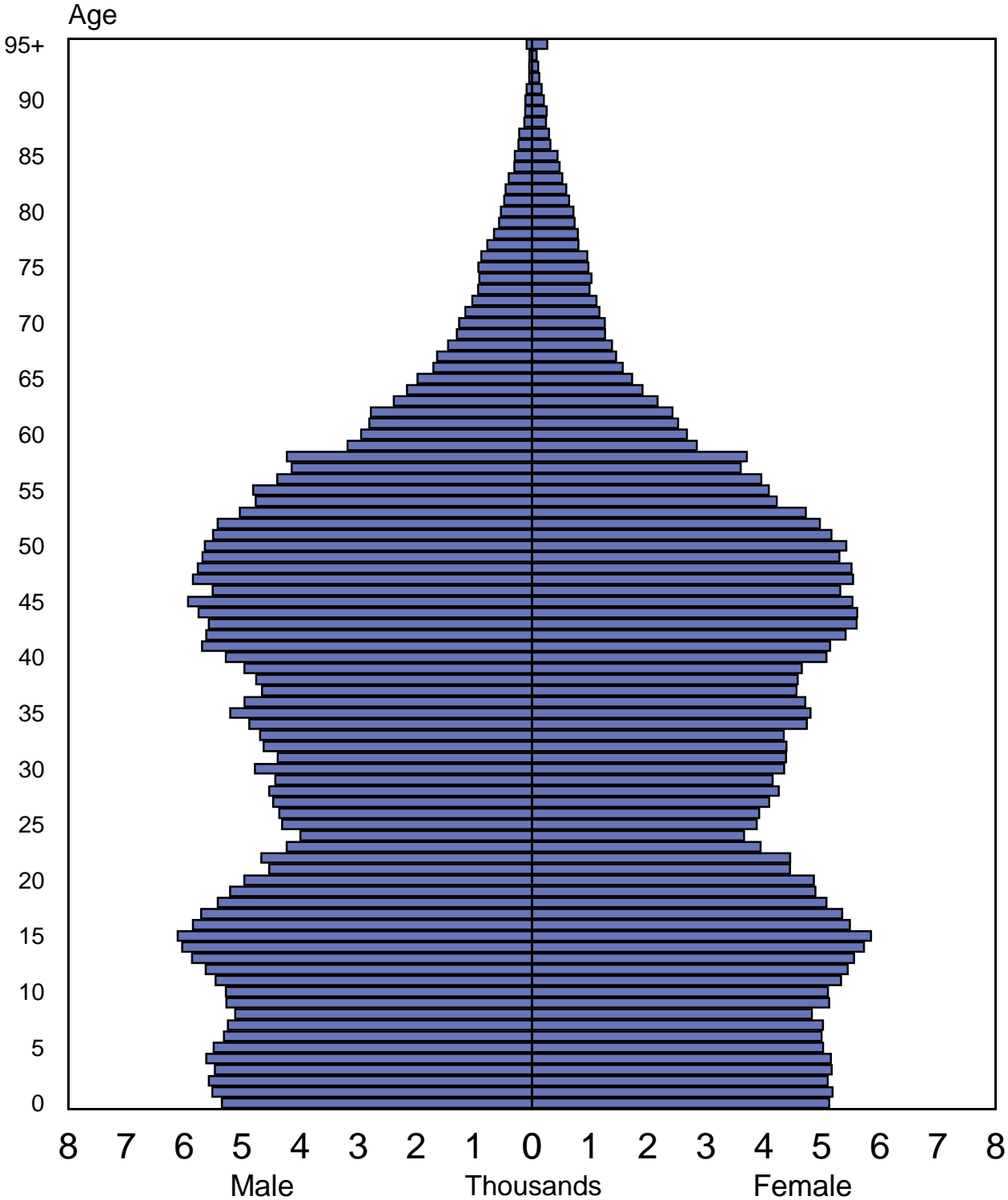
# Alaska Estimated Population by Age and Sex, 2004



Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

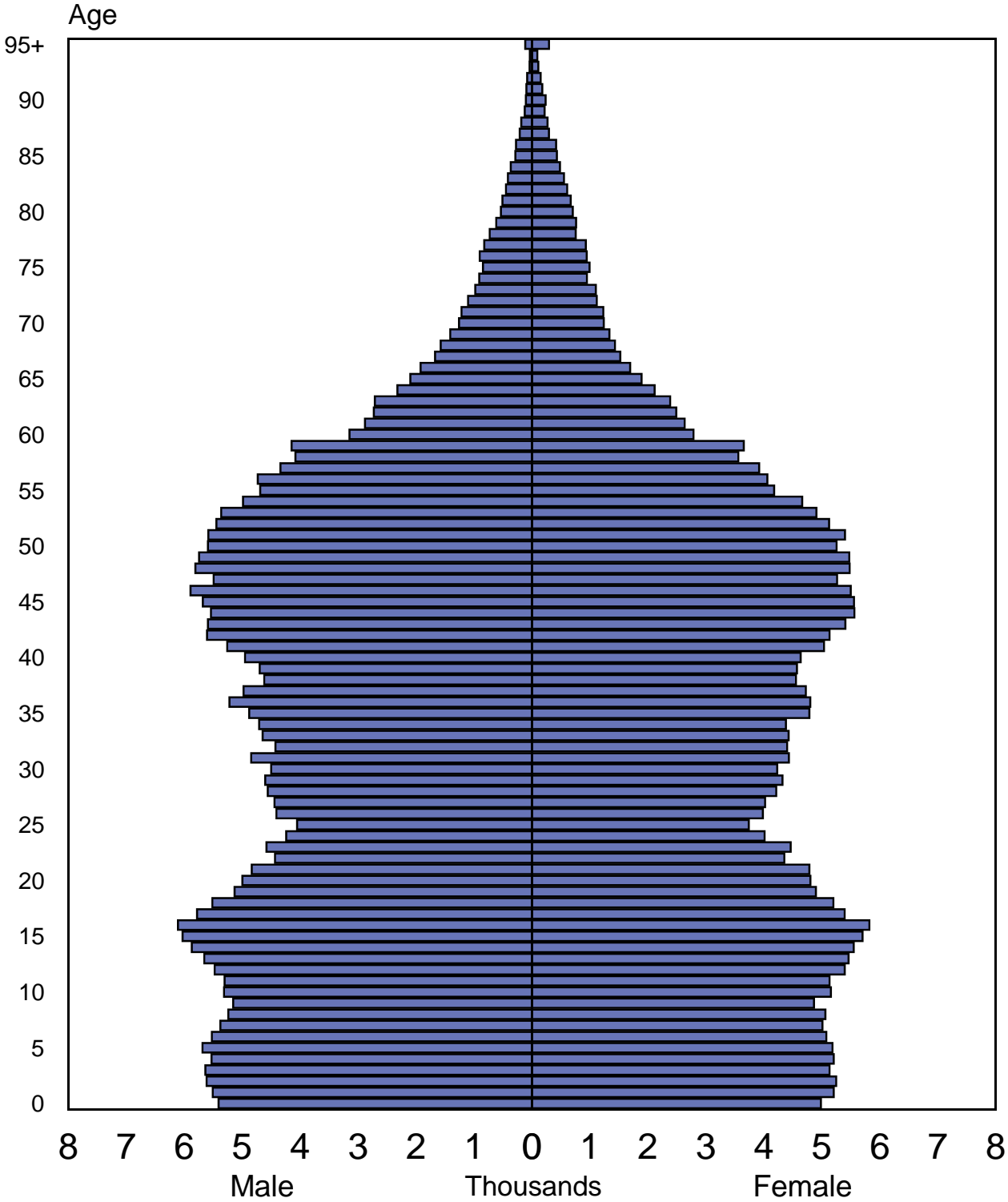


# Alaska Estimated Population by Age and Sex, 2005



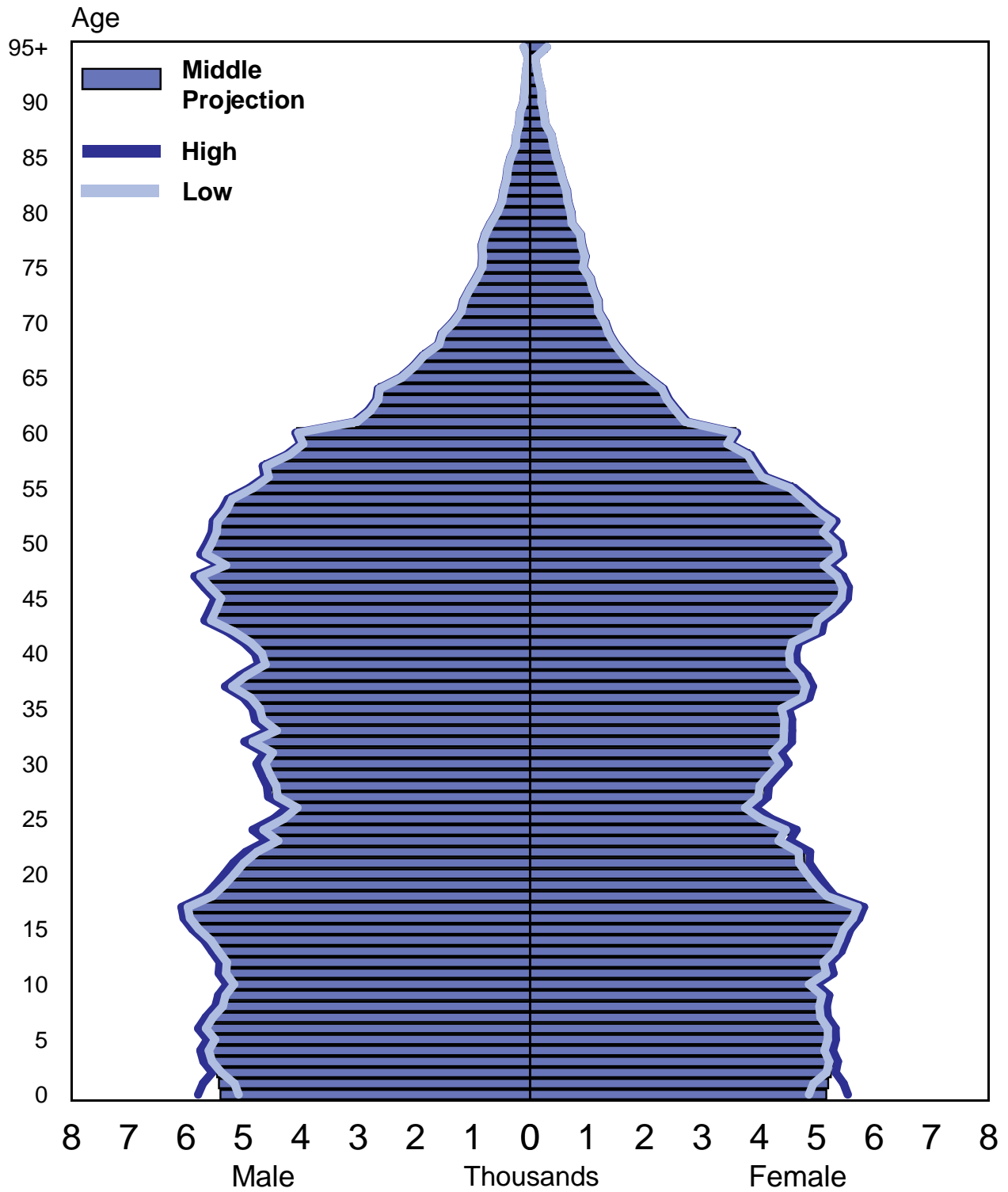
Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Estimated Population by Age and Sex, 2006



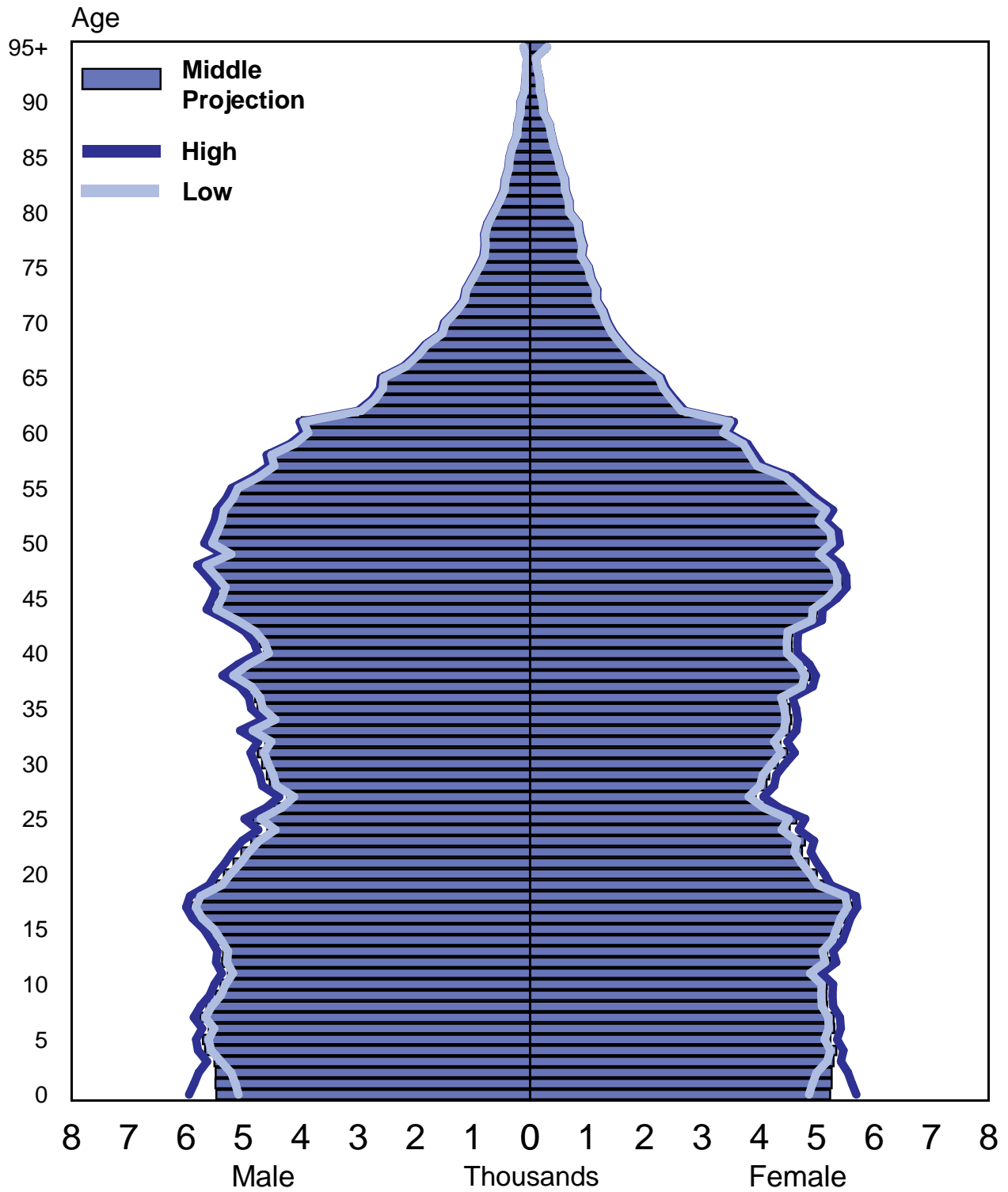
Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2007



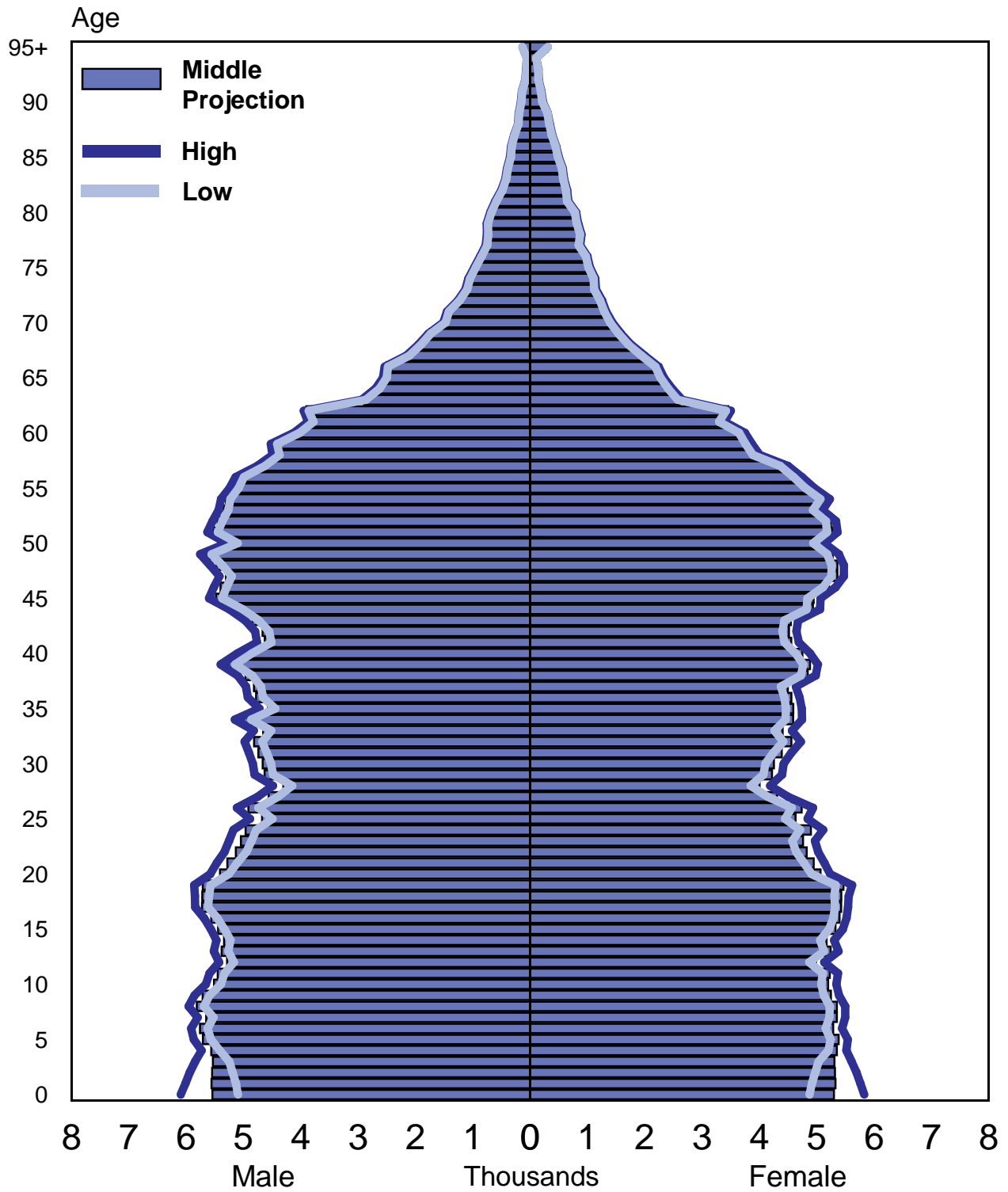
\* Conditionally estimated 90% probability that the future will fall between the "High" and "Low" boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2008



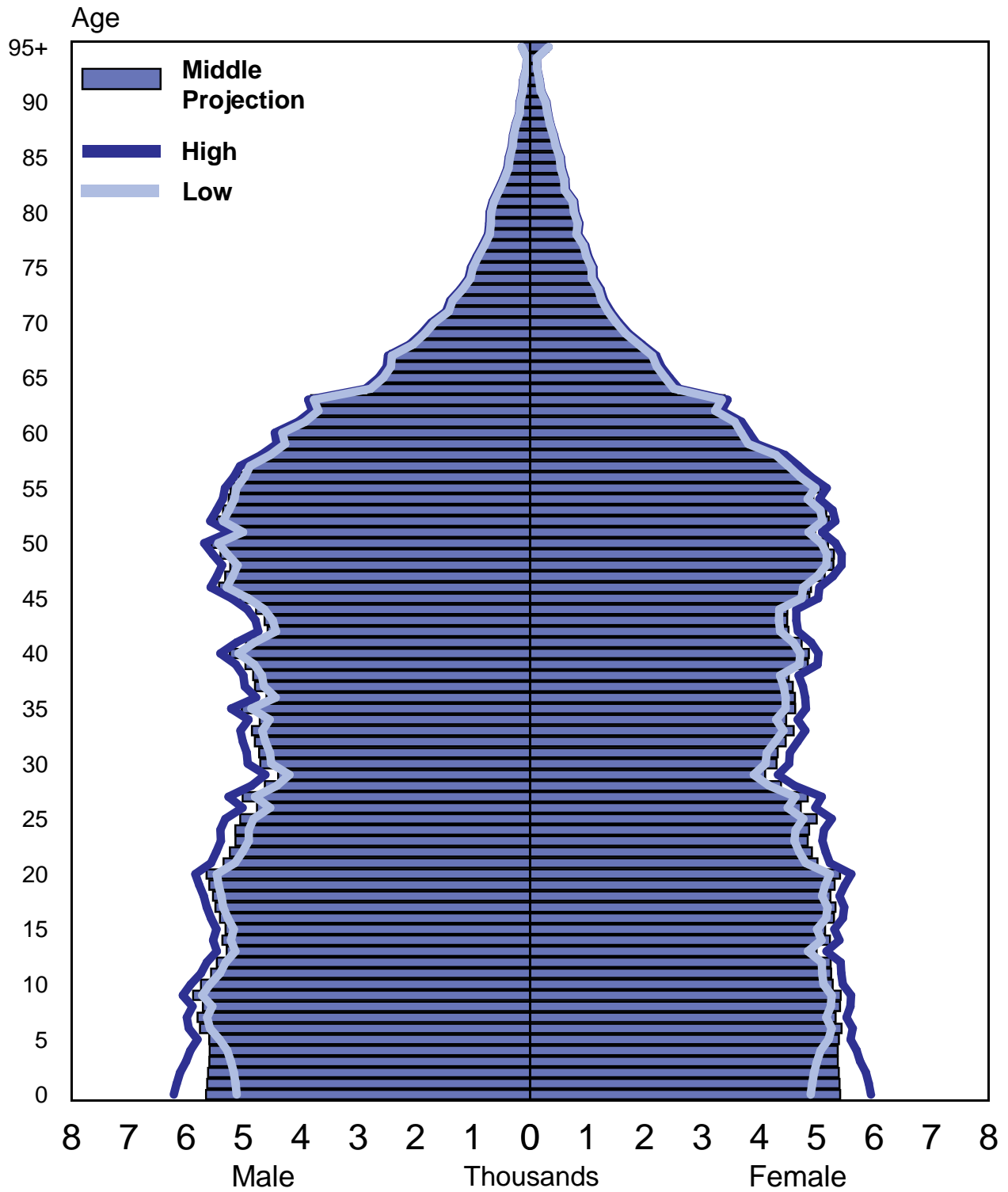
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# Alaska Projected Population by Age and Sex, 2009



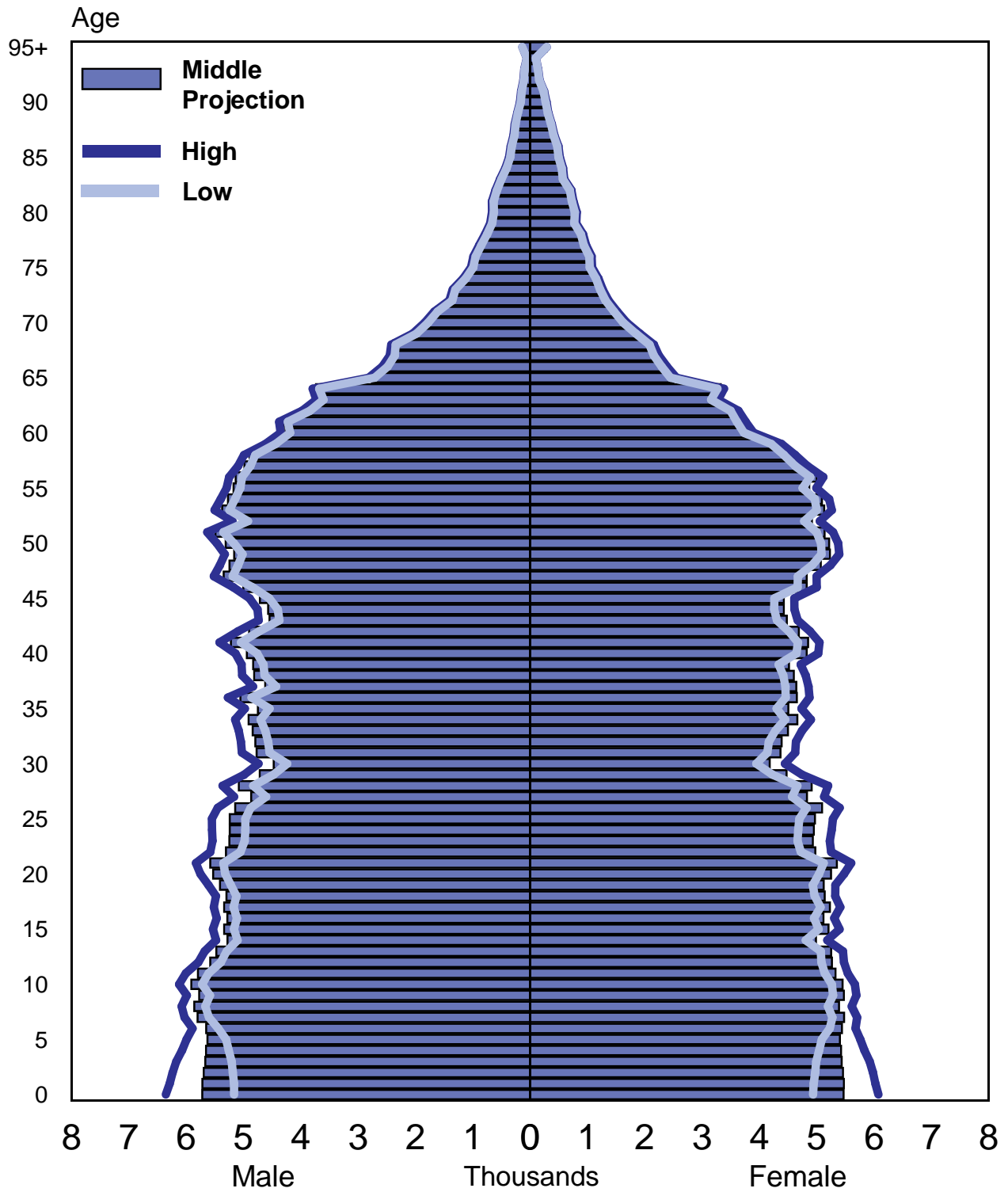
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 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2010



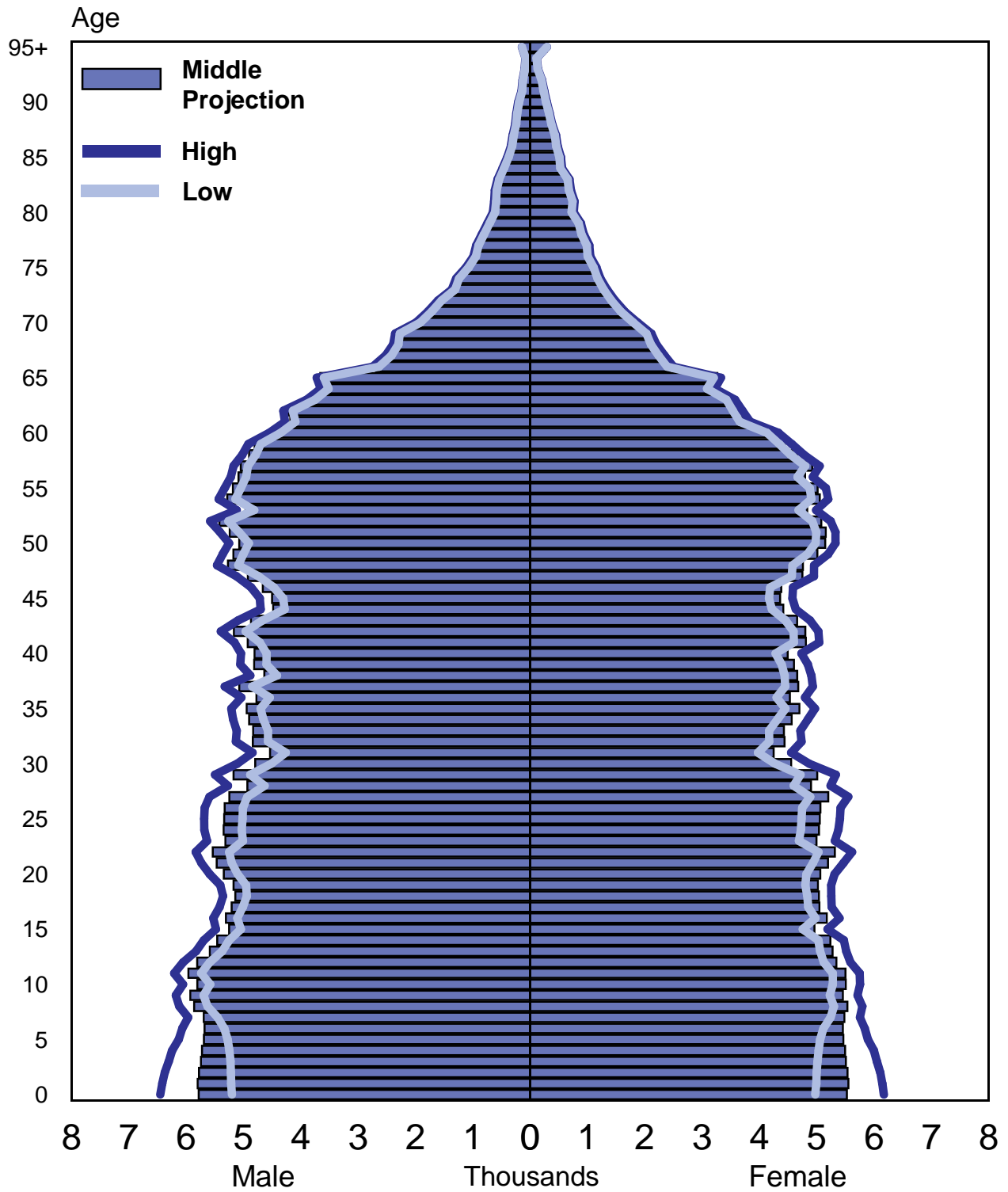
\* Conditionally estimated 90% probability that the future will fall between the "High" and "Low" boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2011



\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

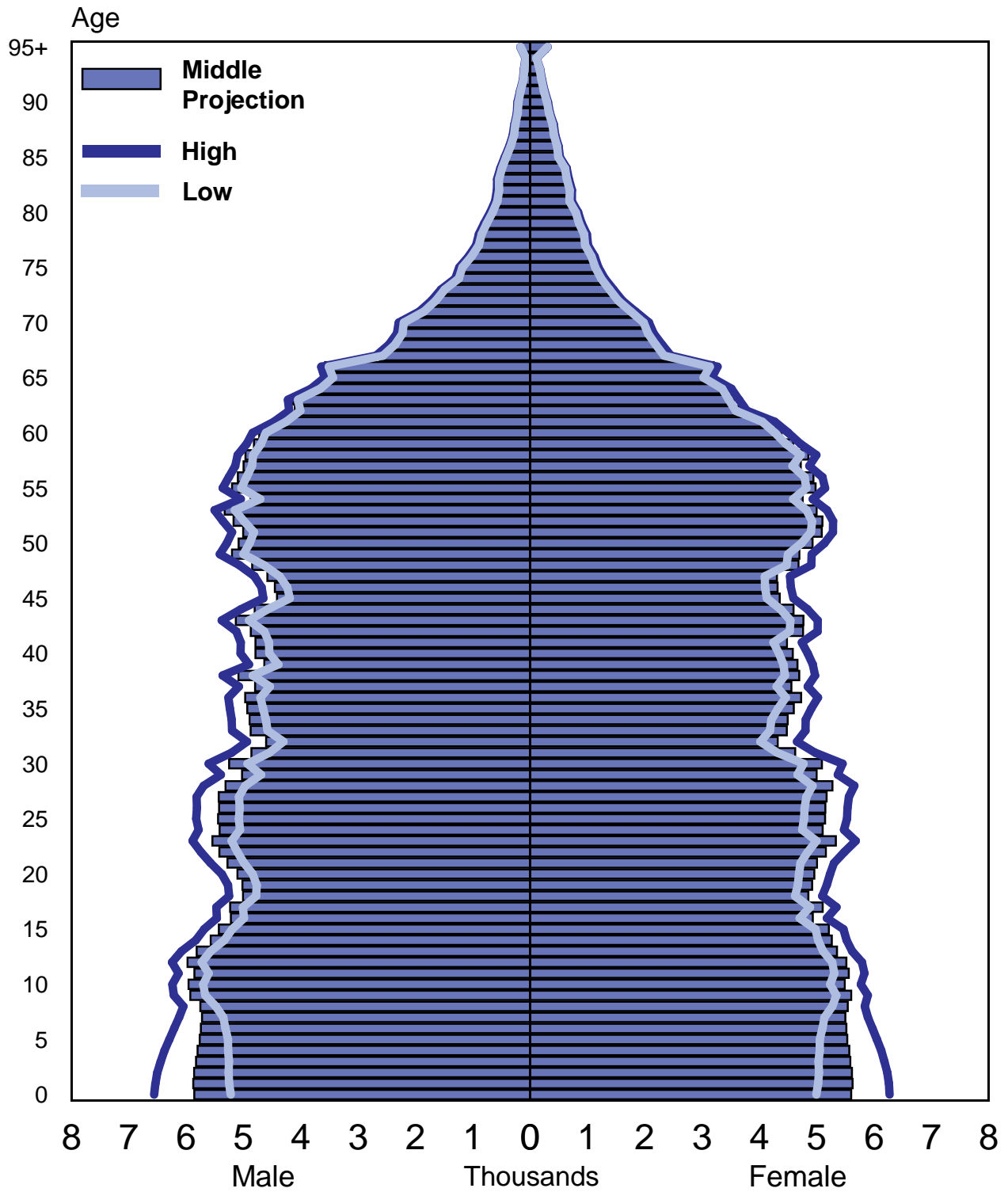
# Alaska Projected Population by Age and Sex, 2012



\* Conditionally estimated 90% probability that the future will fall between the "High" and "Low" boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

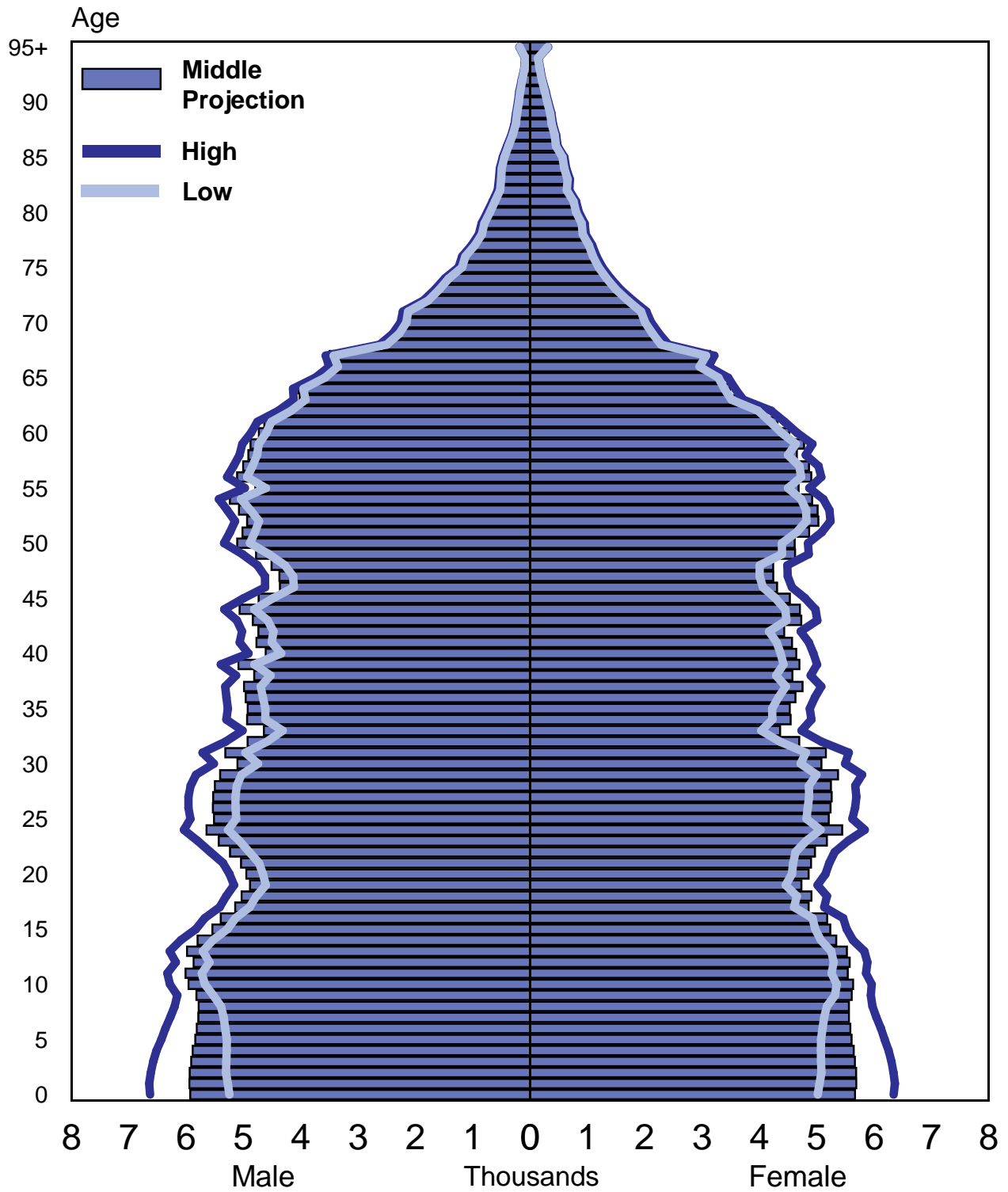


# Alaska Projected Population by Age and Sex, 2013



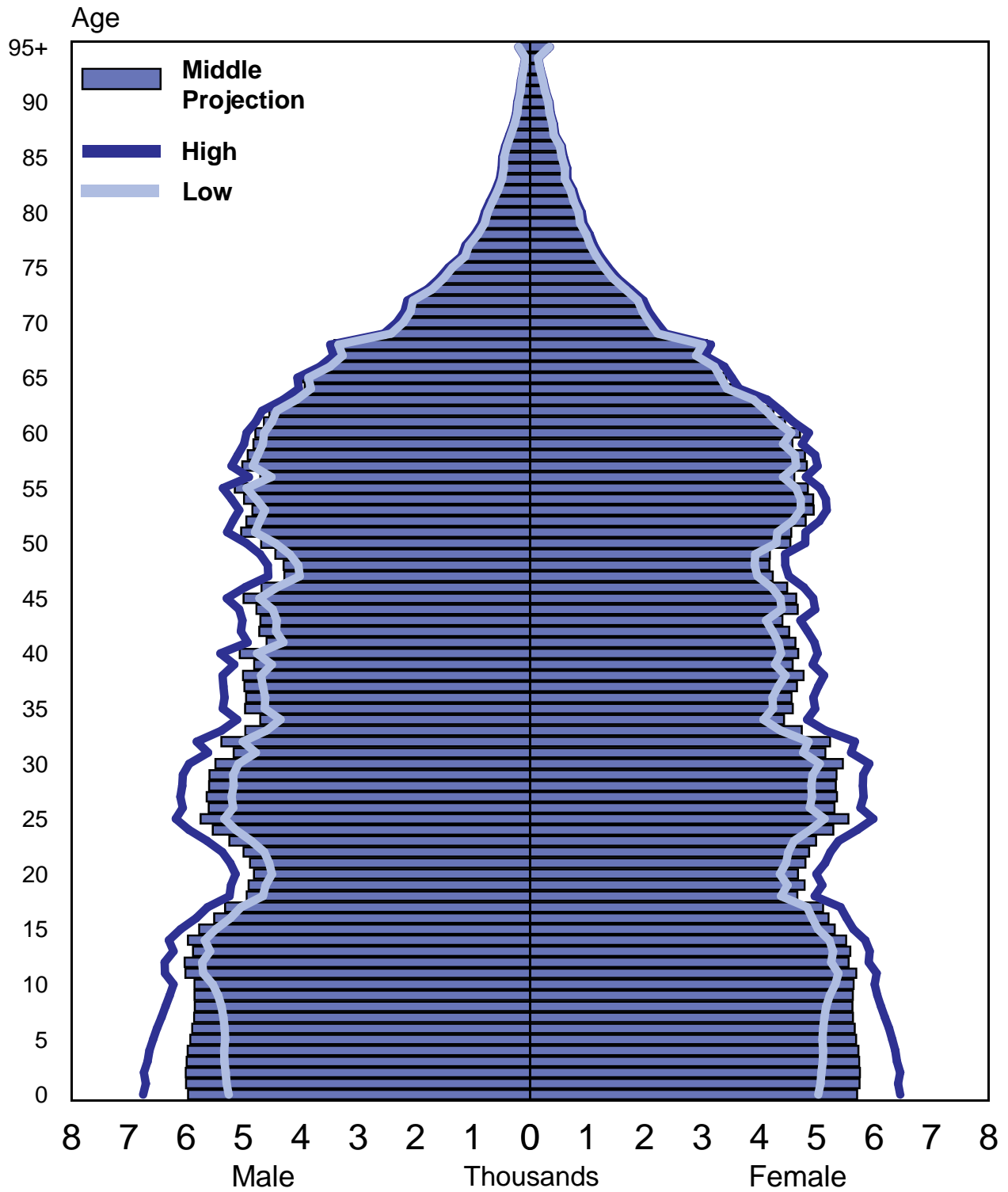
\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2014



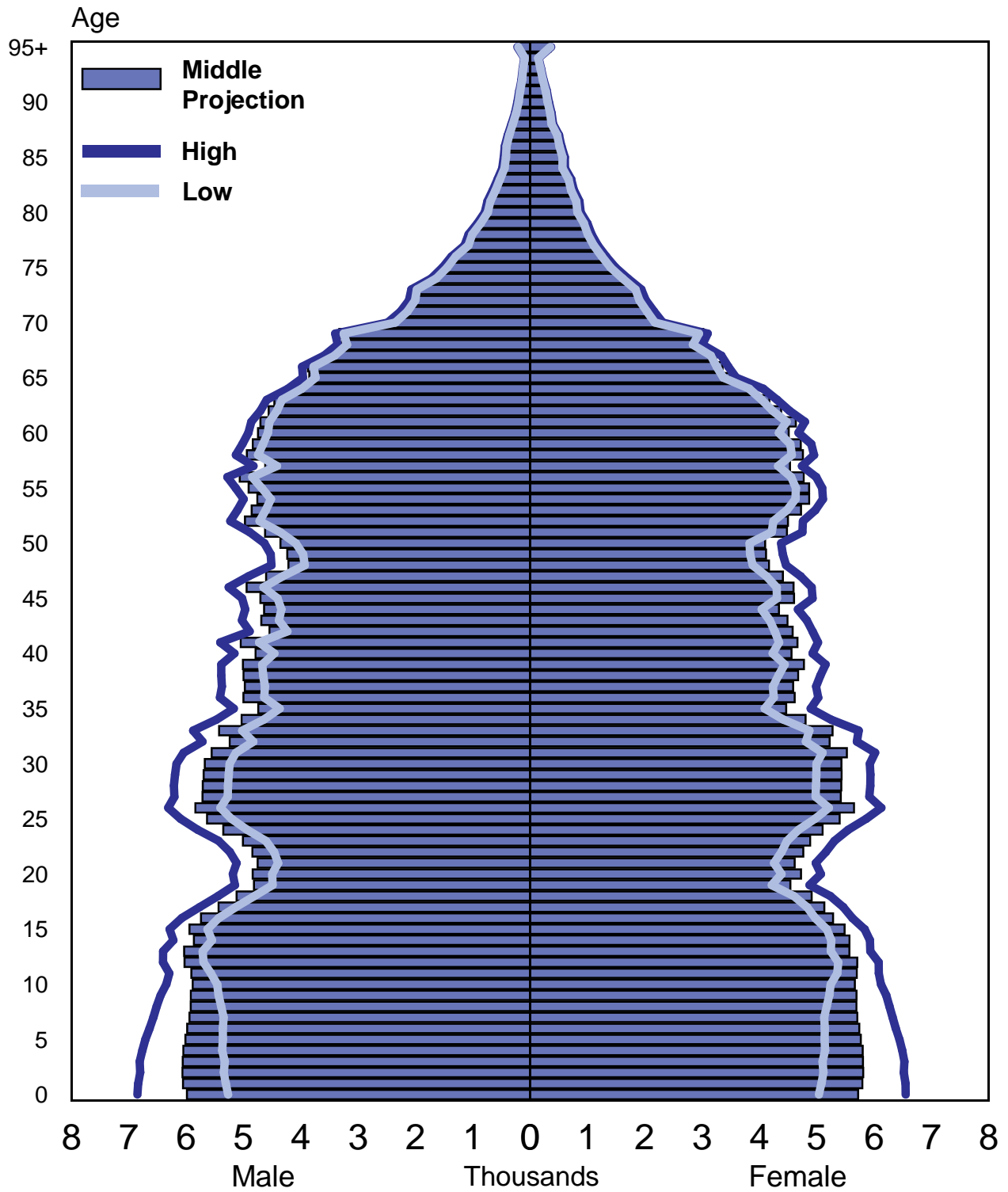
\* Conditionally estimated 90% probability that the future will fall between the "High" and "Low" boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2015



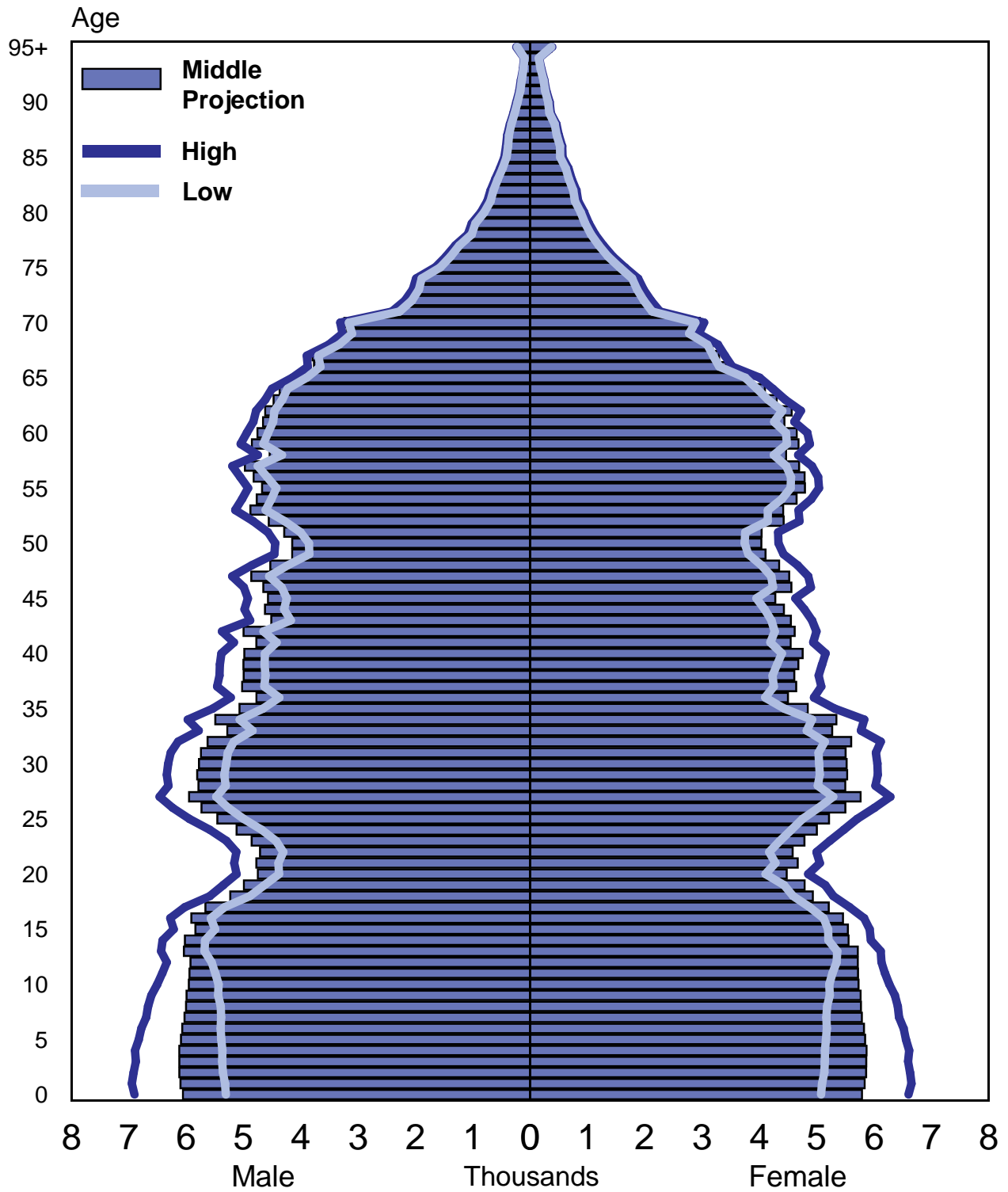
\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2016



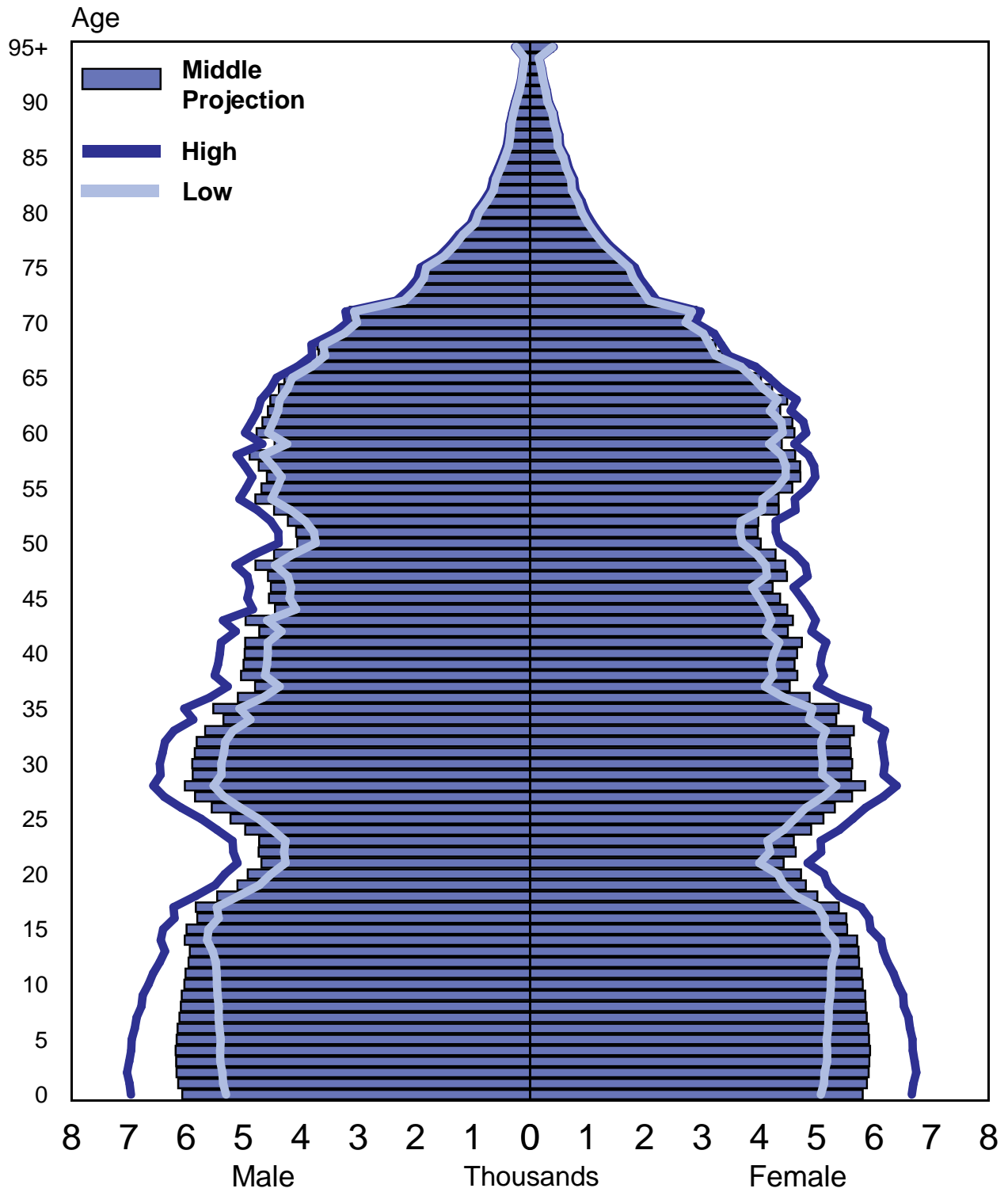
\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2017



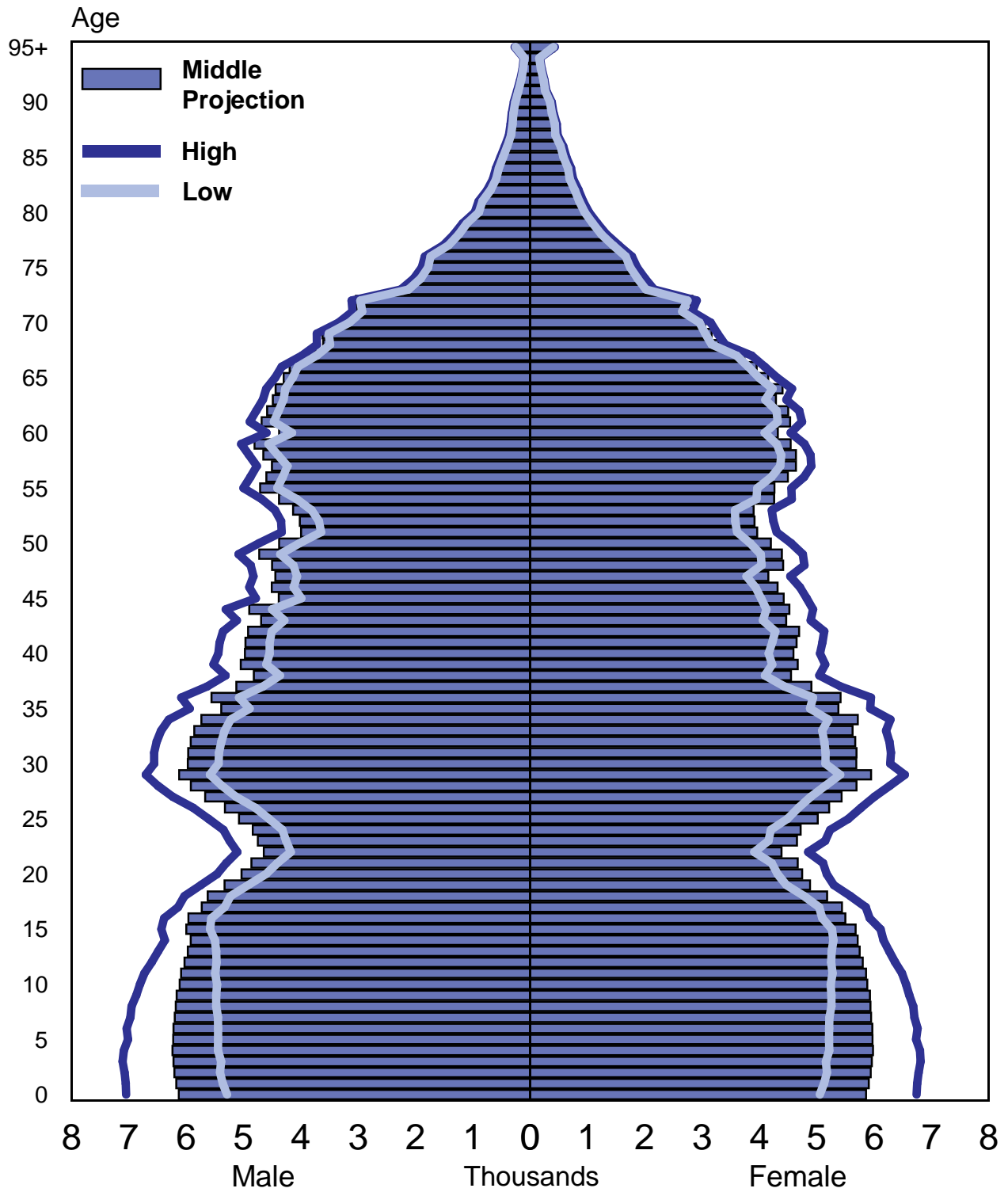
\* Conditionally estimated 90% probability that the future will fall between the "High" and "Low" boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2018



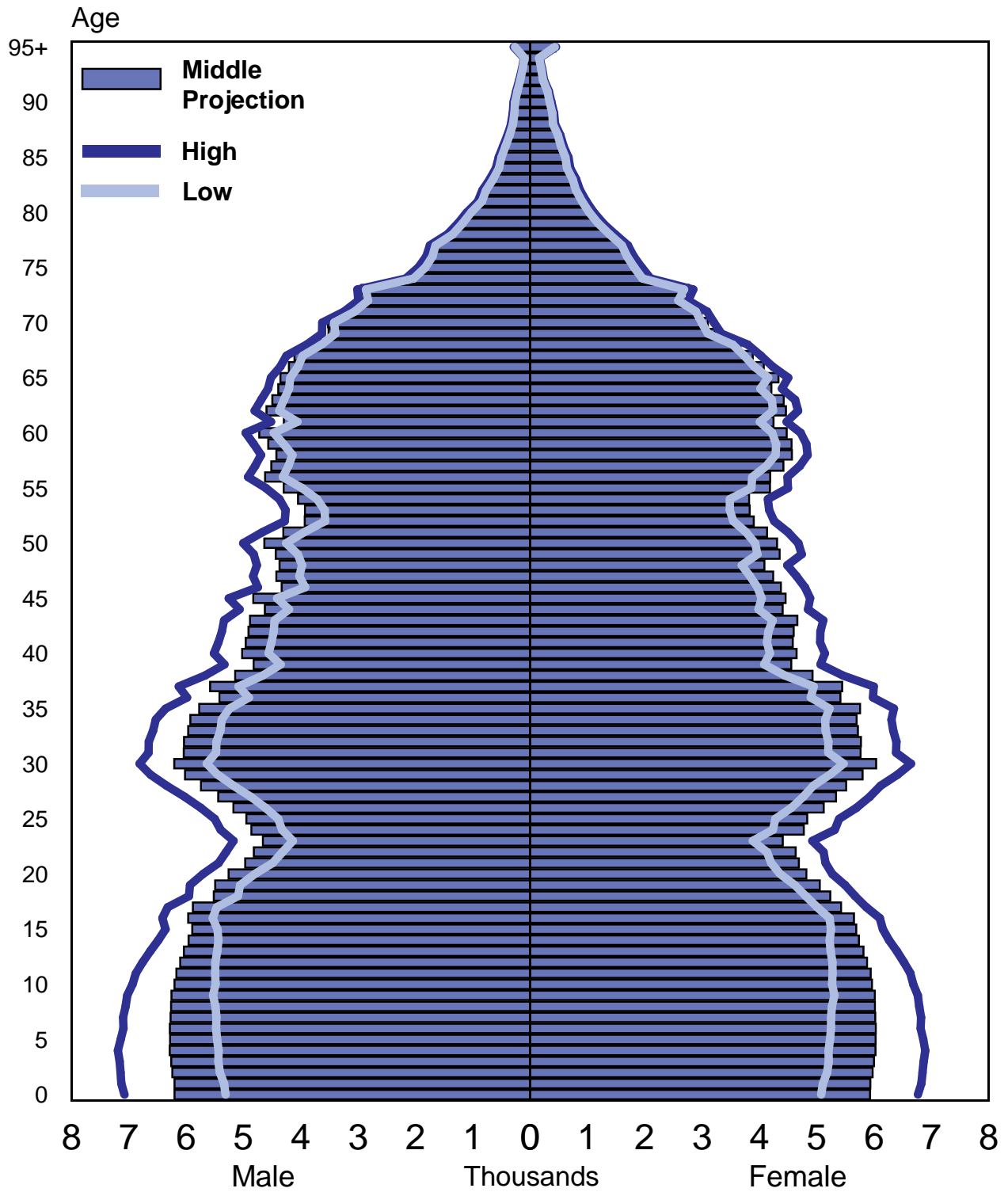
\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2019



\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

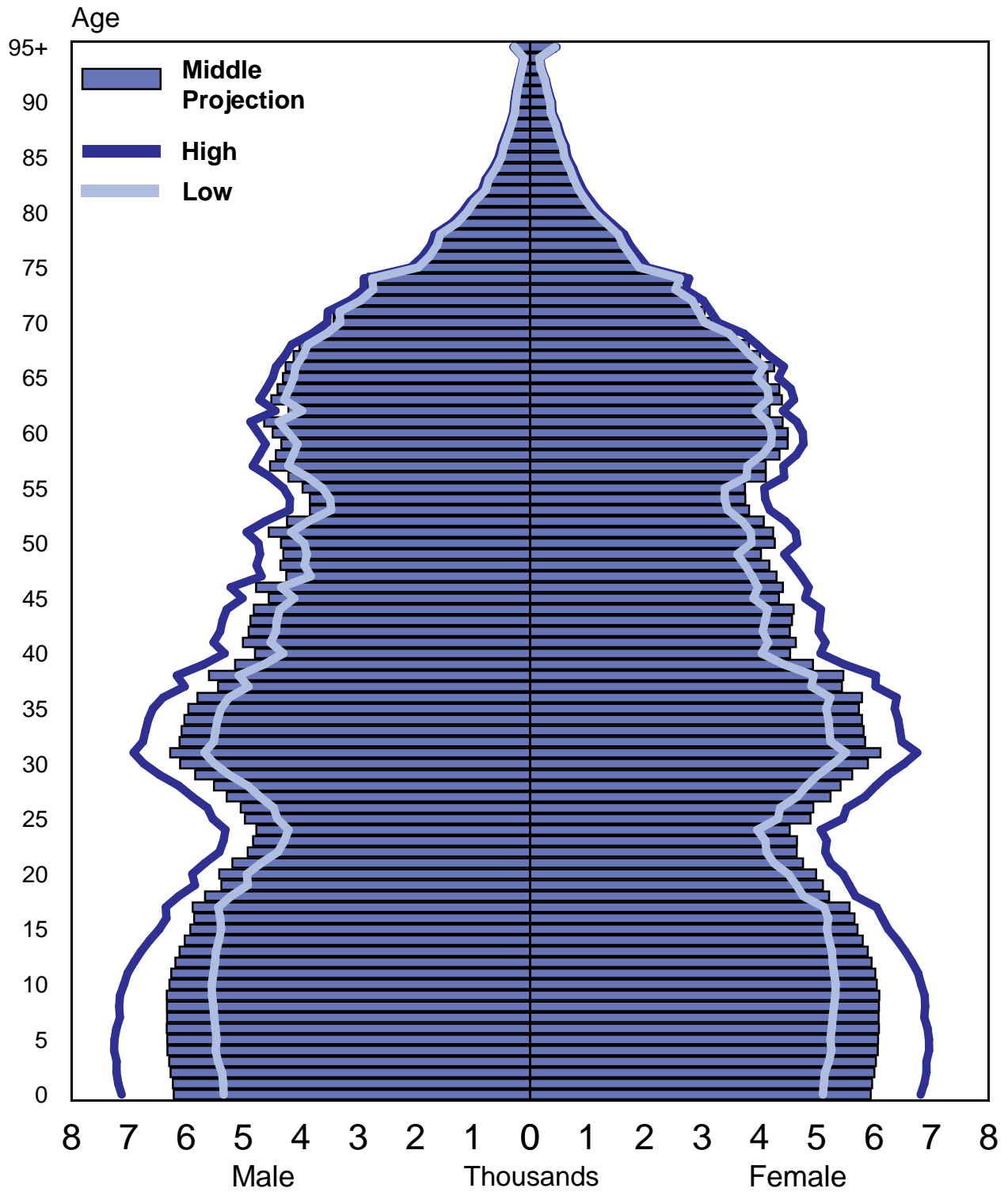
# Alaska Projected Population by Age and Sex, 2020



\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

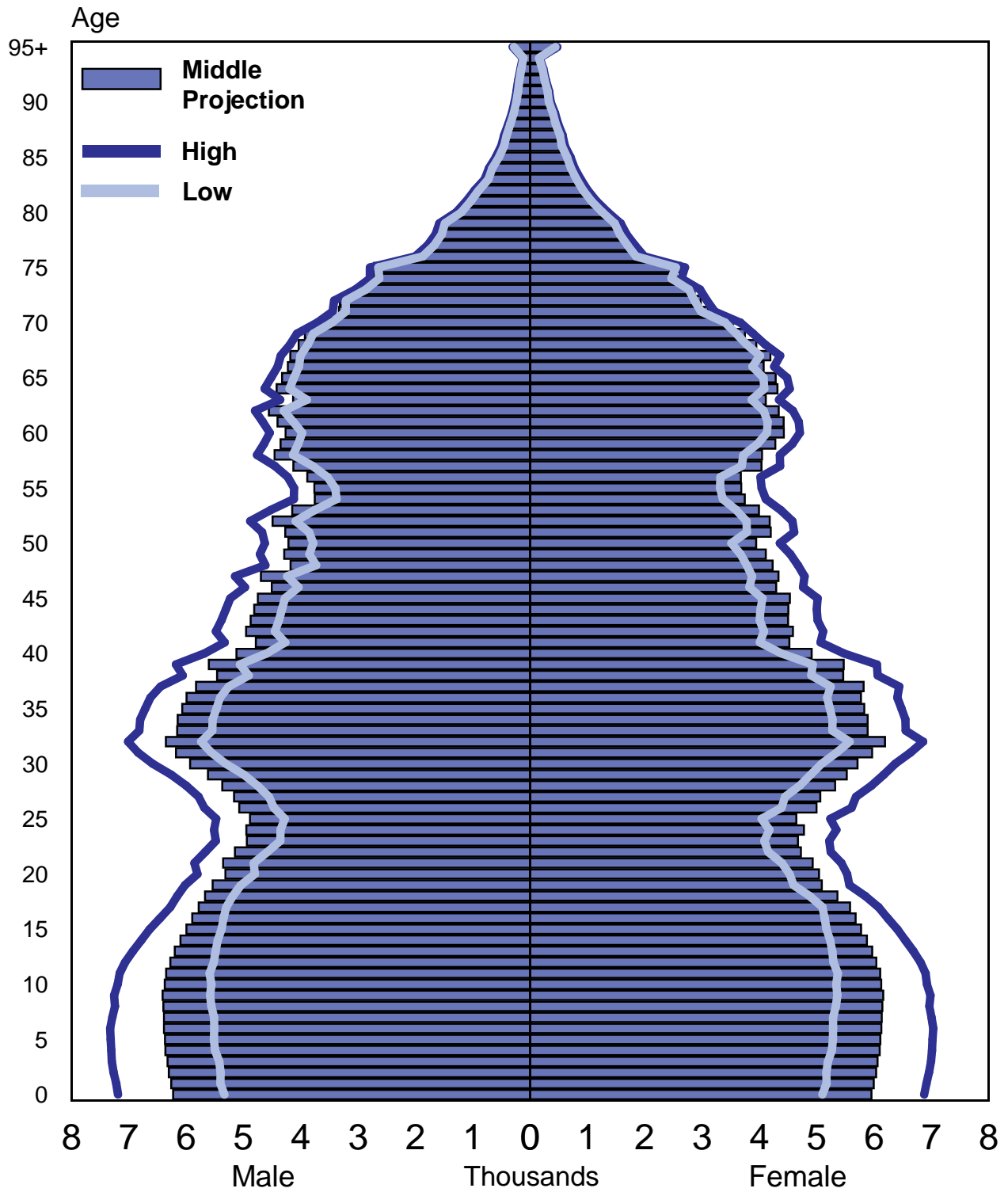


# Alaska Projected Population by Age and Sex, 2021



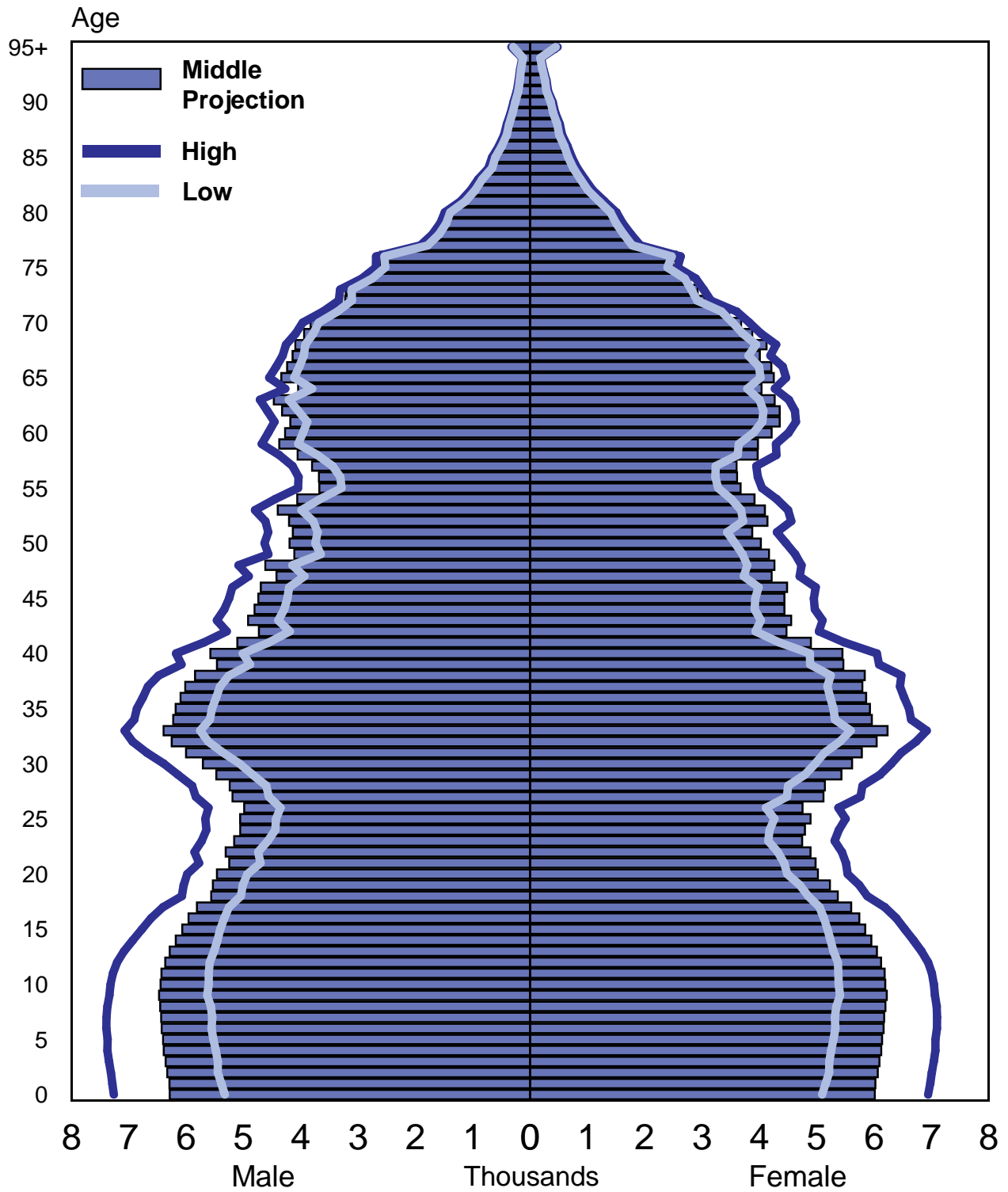
\* Conditionally estimated 90% probability that the future will fall between the "High" and "Low" boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2022



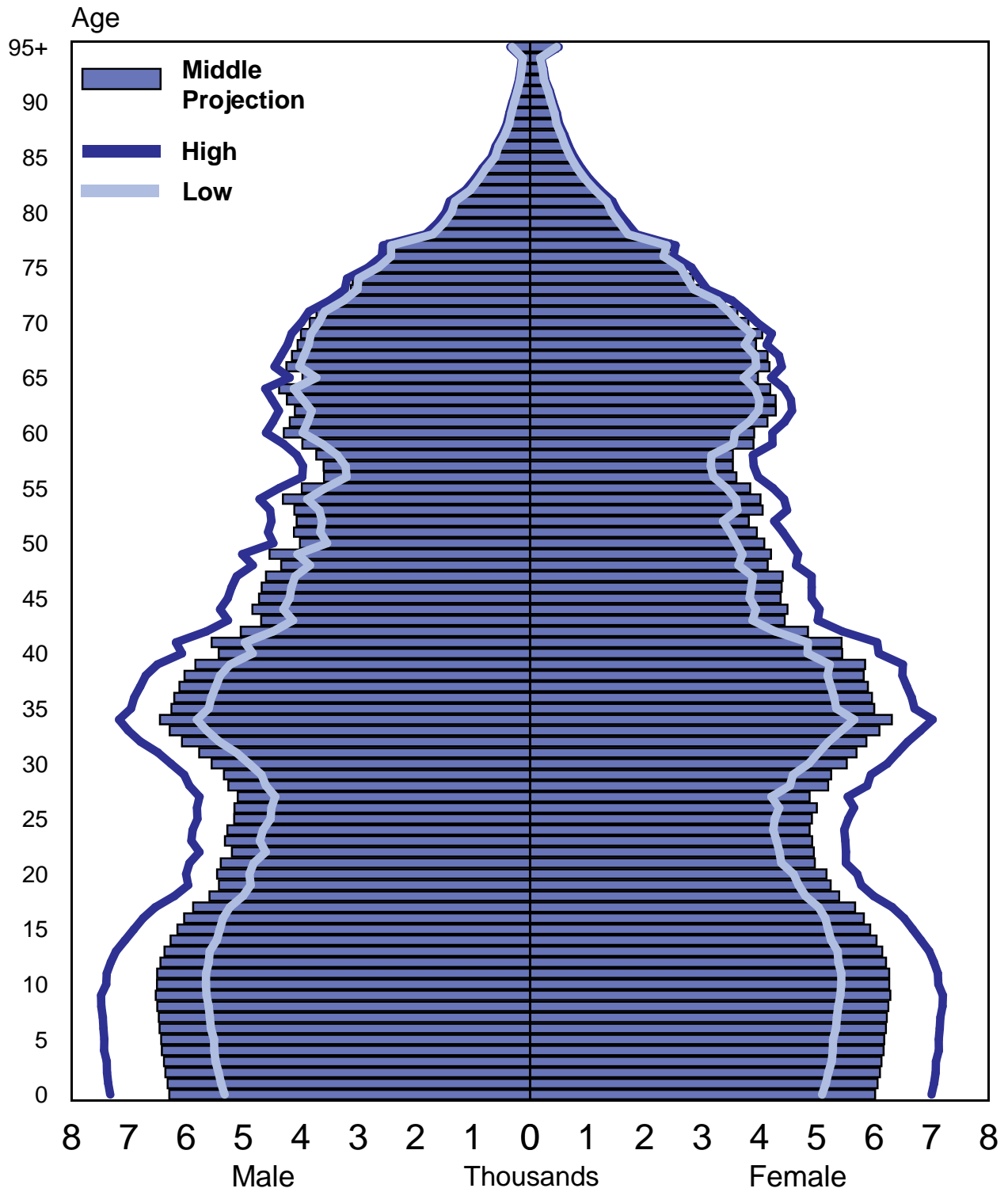
\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2023



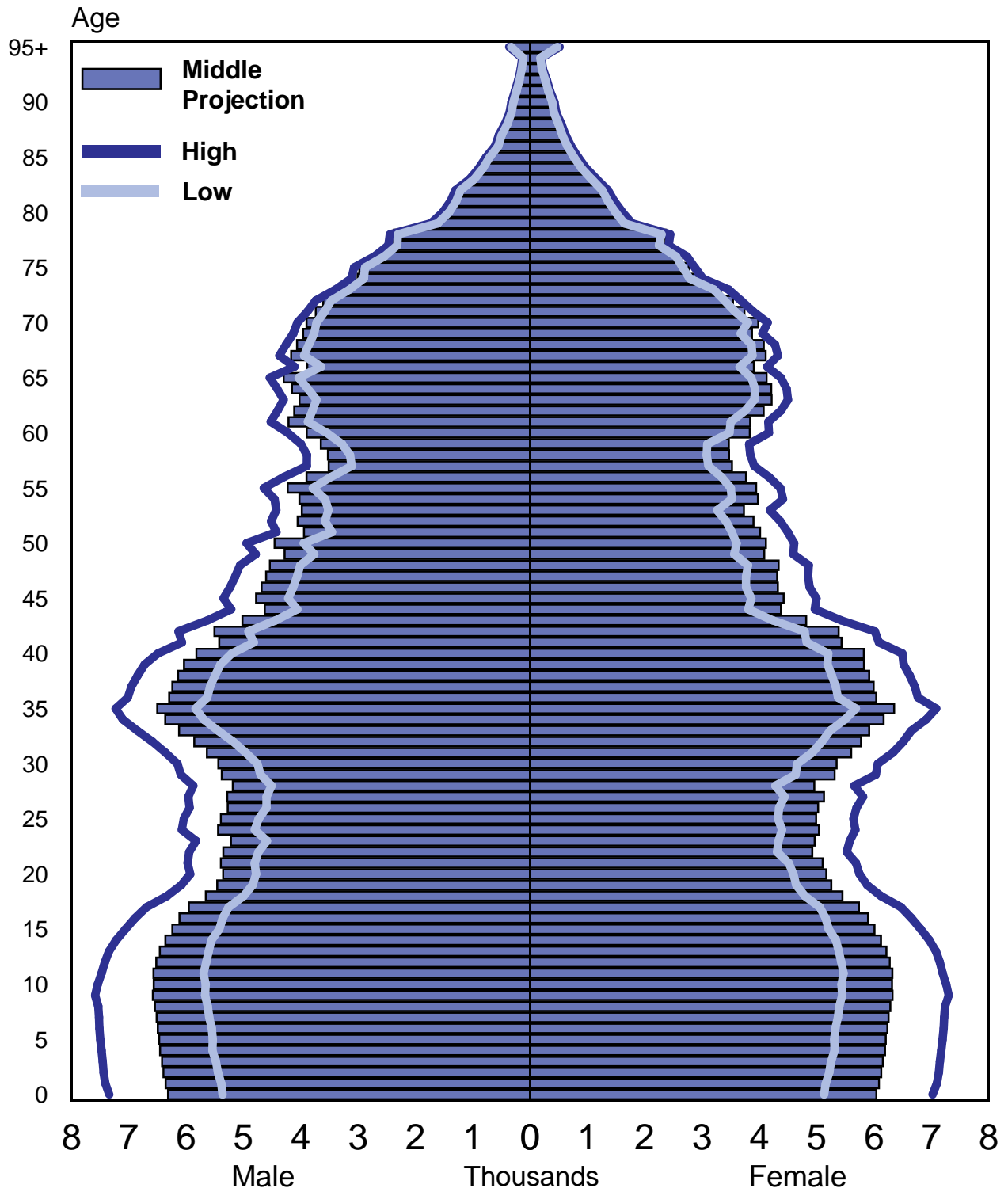
\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2024



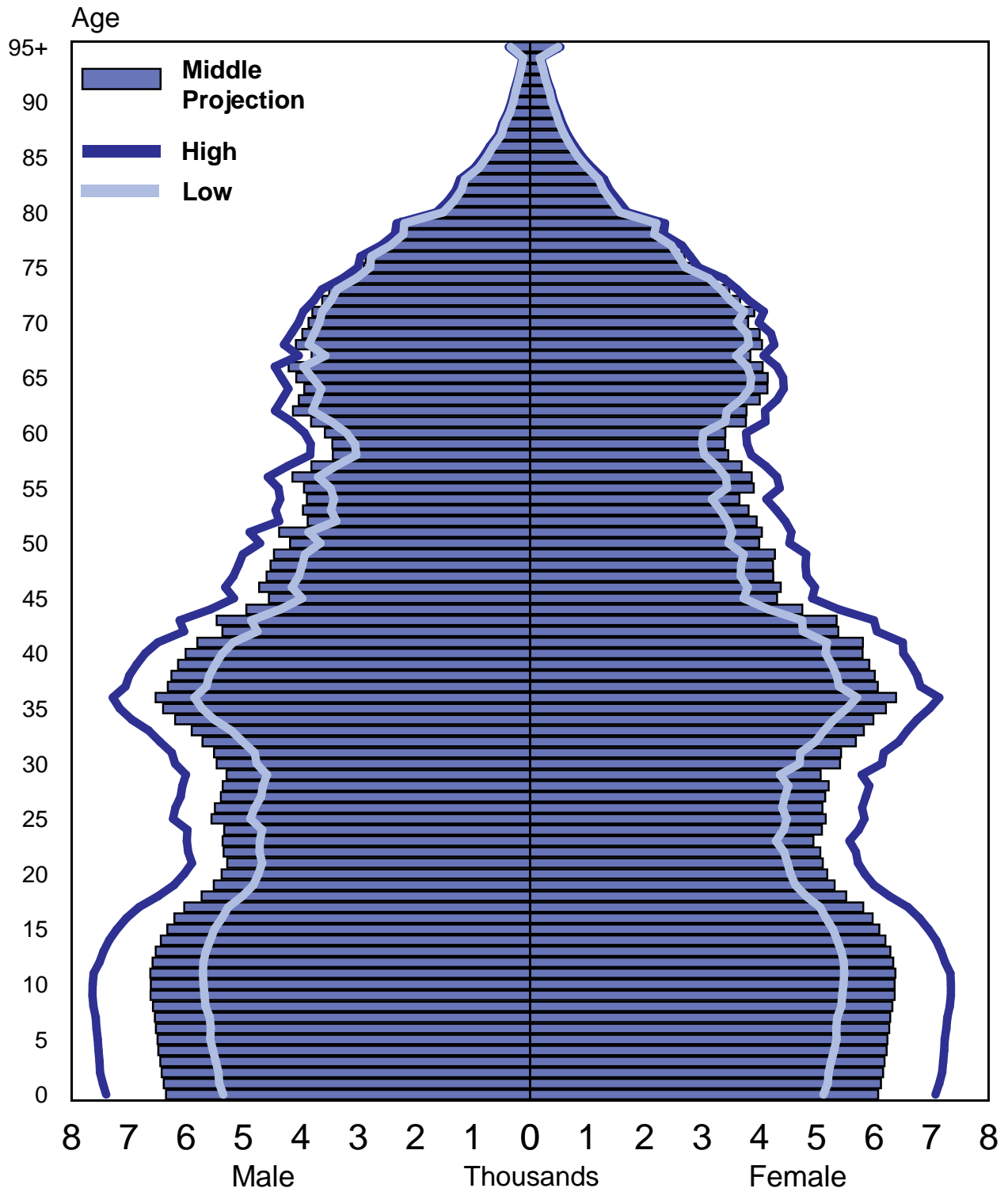
\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2025



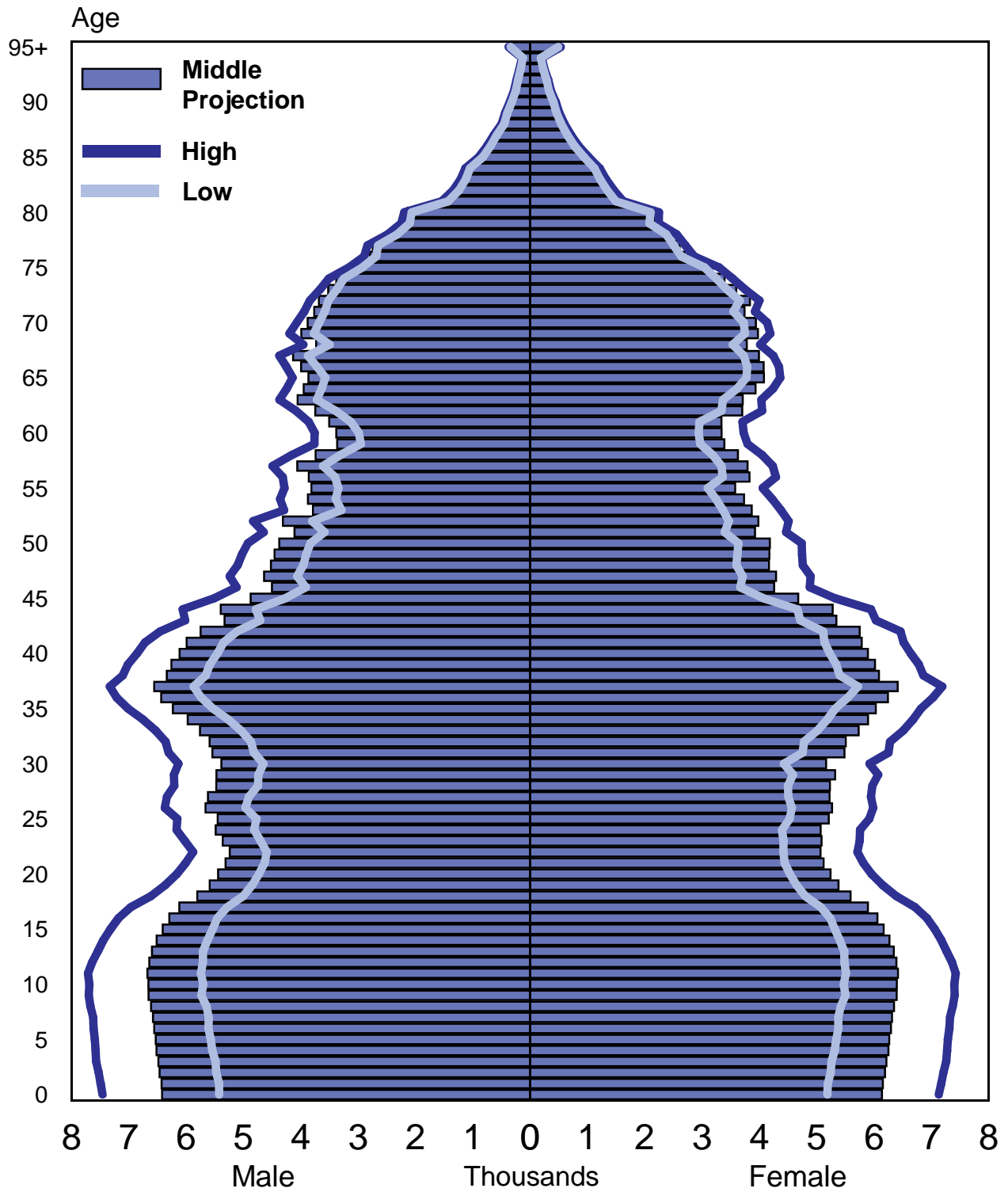
\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2026



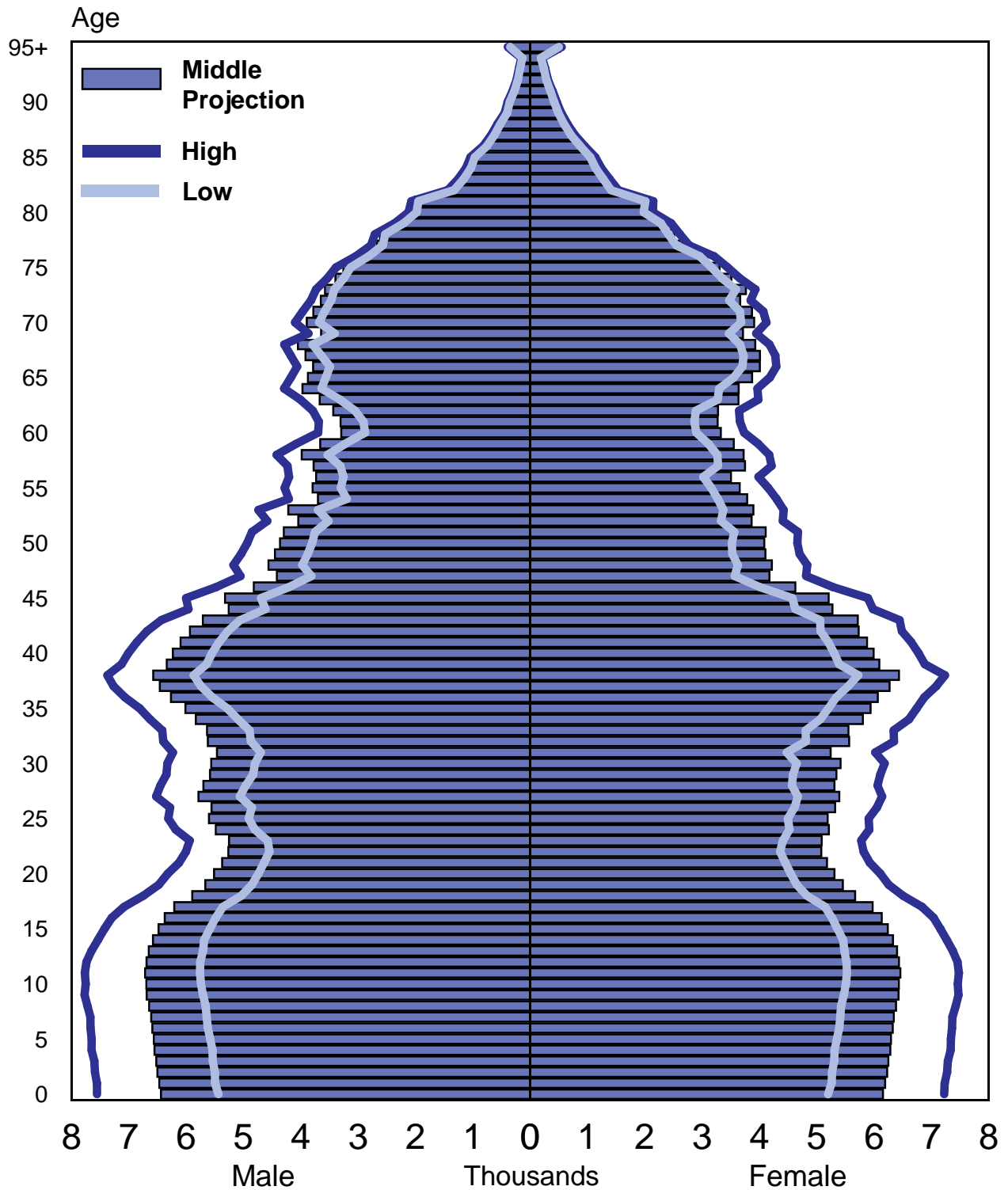
\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2027



\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

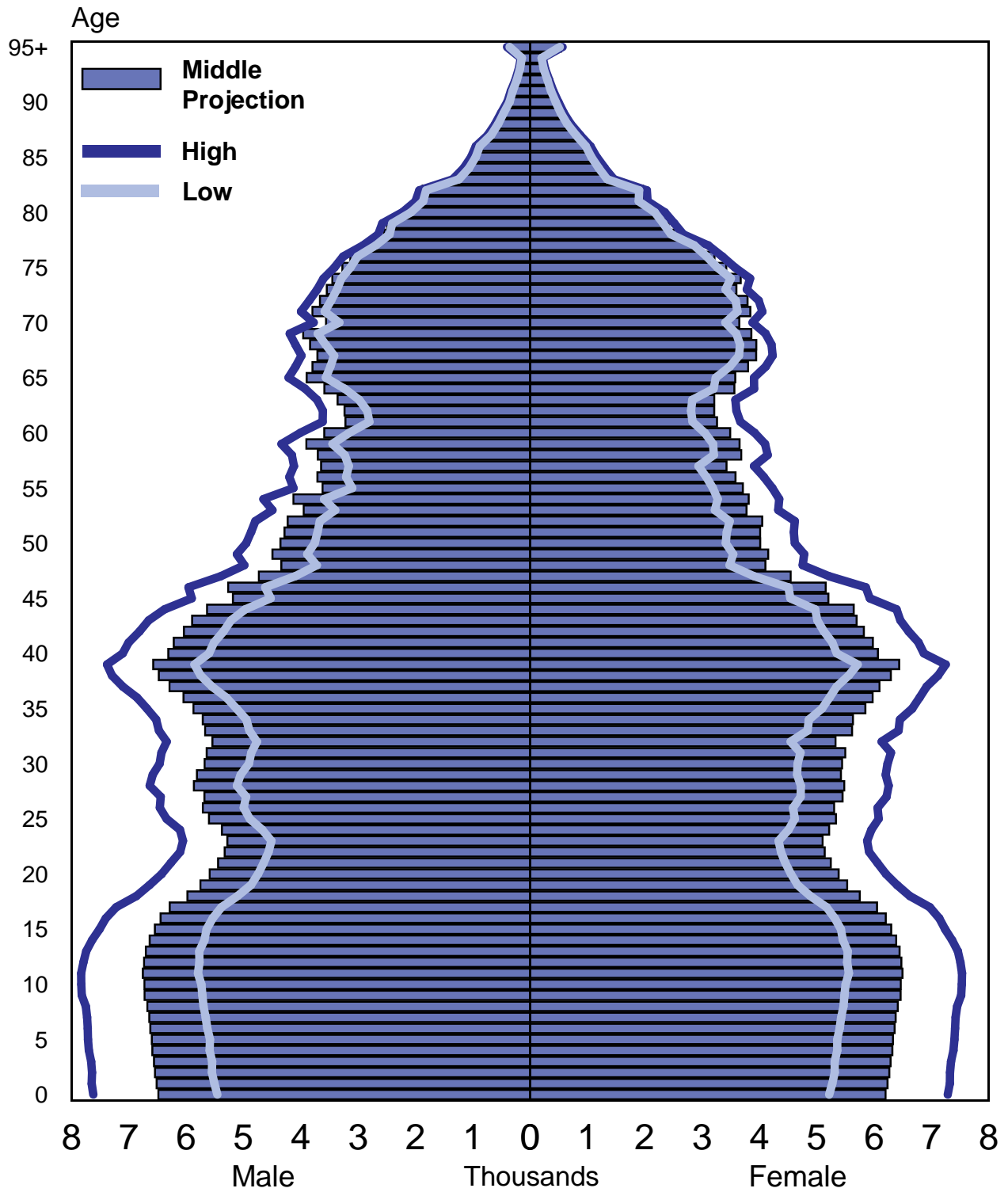
# Alaska Projected Population by Age and Sex, 2028



\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

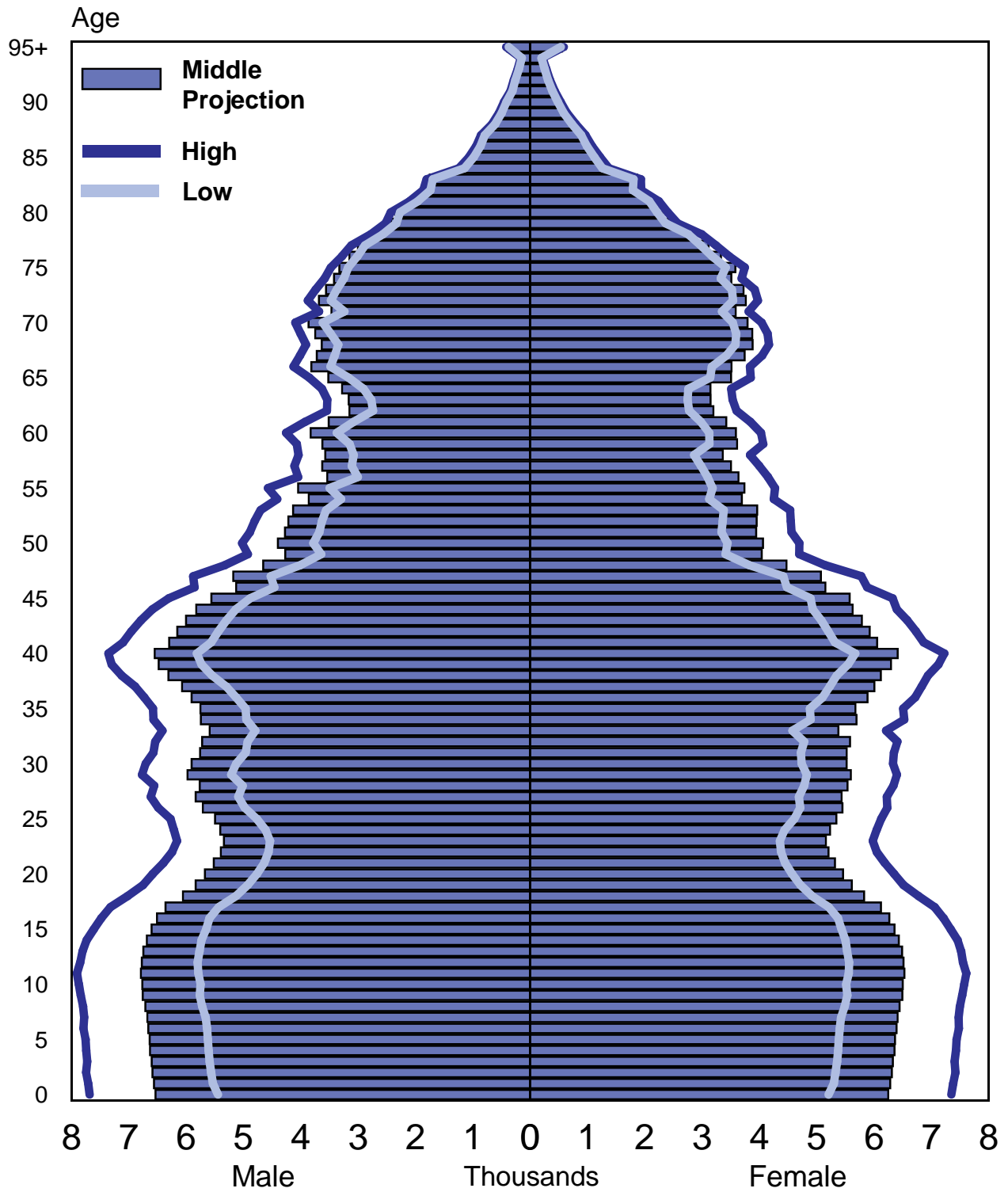


# Alaska Projected Population by Age and Sex, 2029



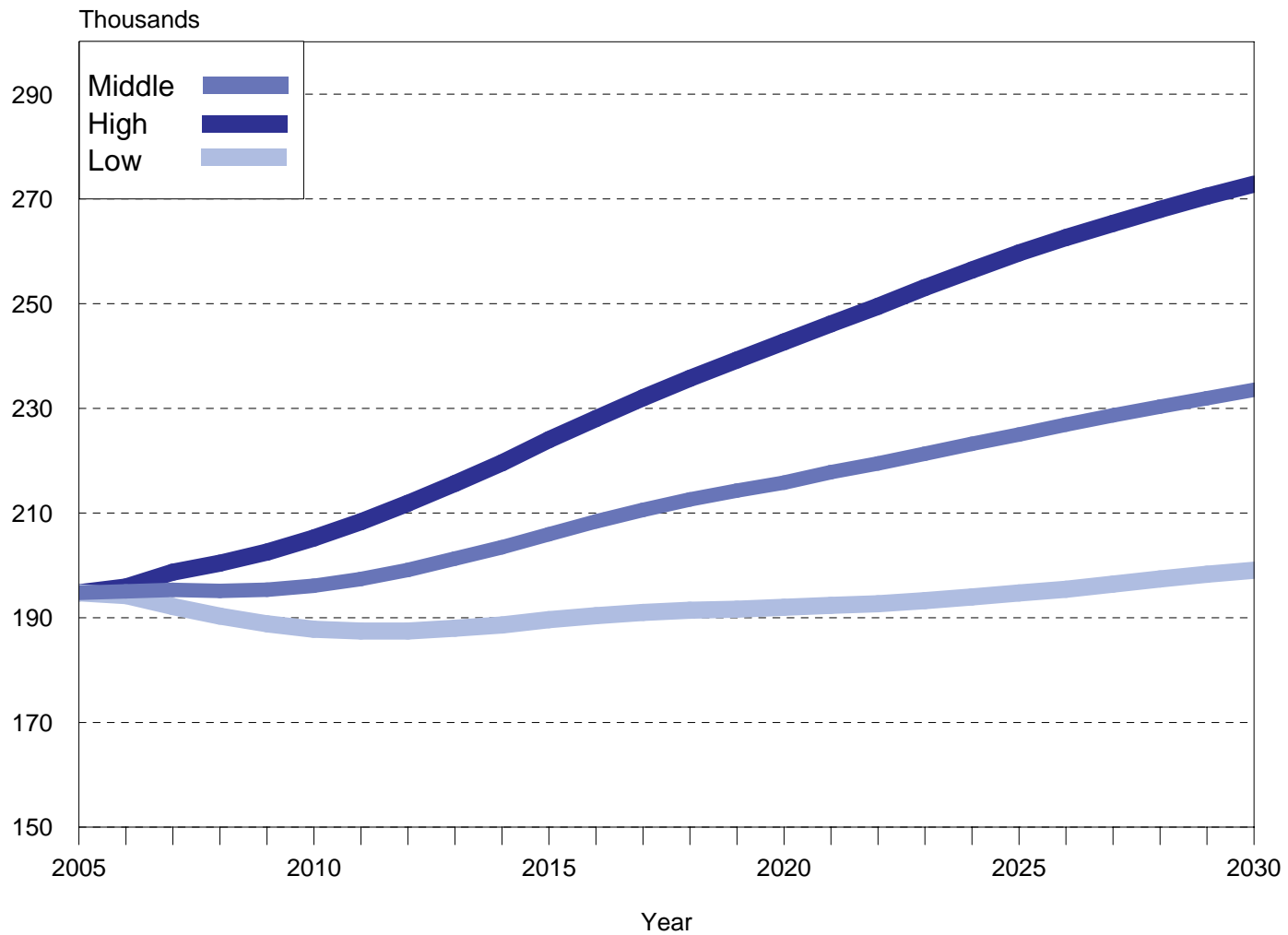
\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska Projected Population by Age and Sex, 2030



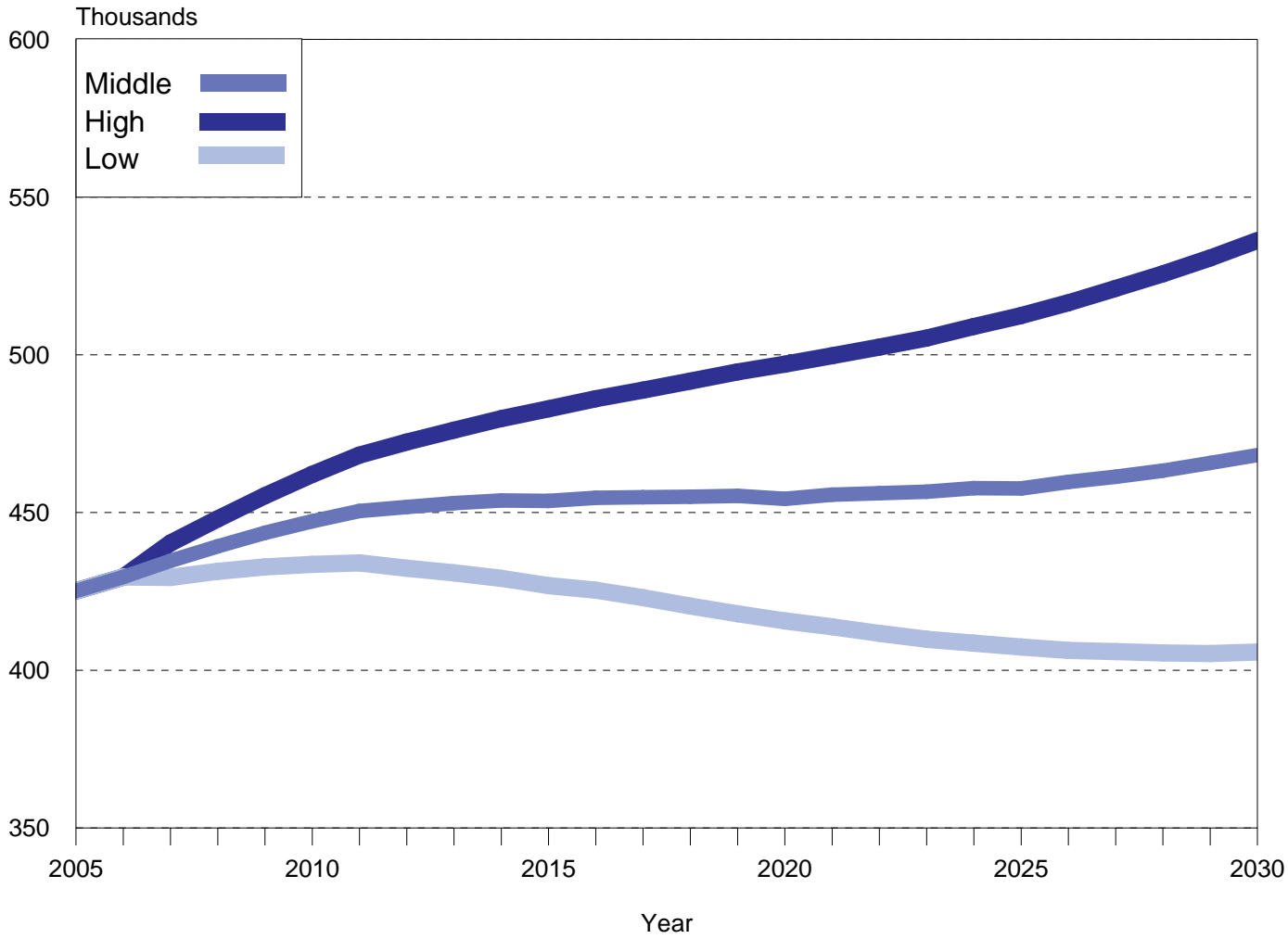
\* Conditionally estimated 90% probability that the future will fall between the “High” and “Low” boundaries  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska's Projected Population Ages 0-17 2005-2030



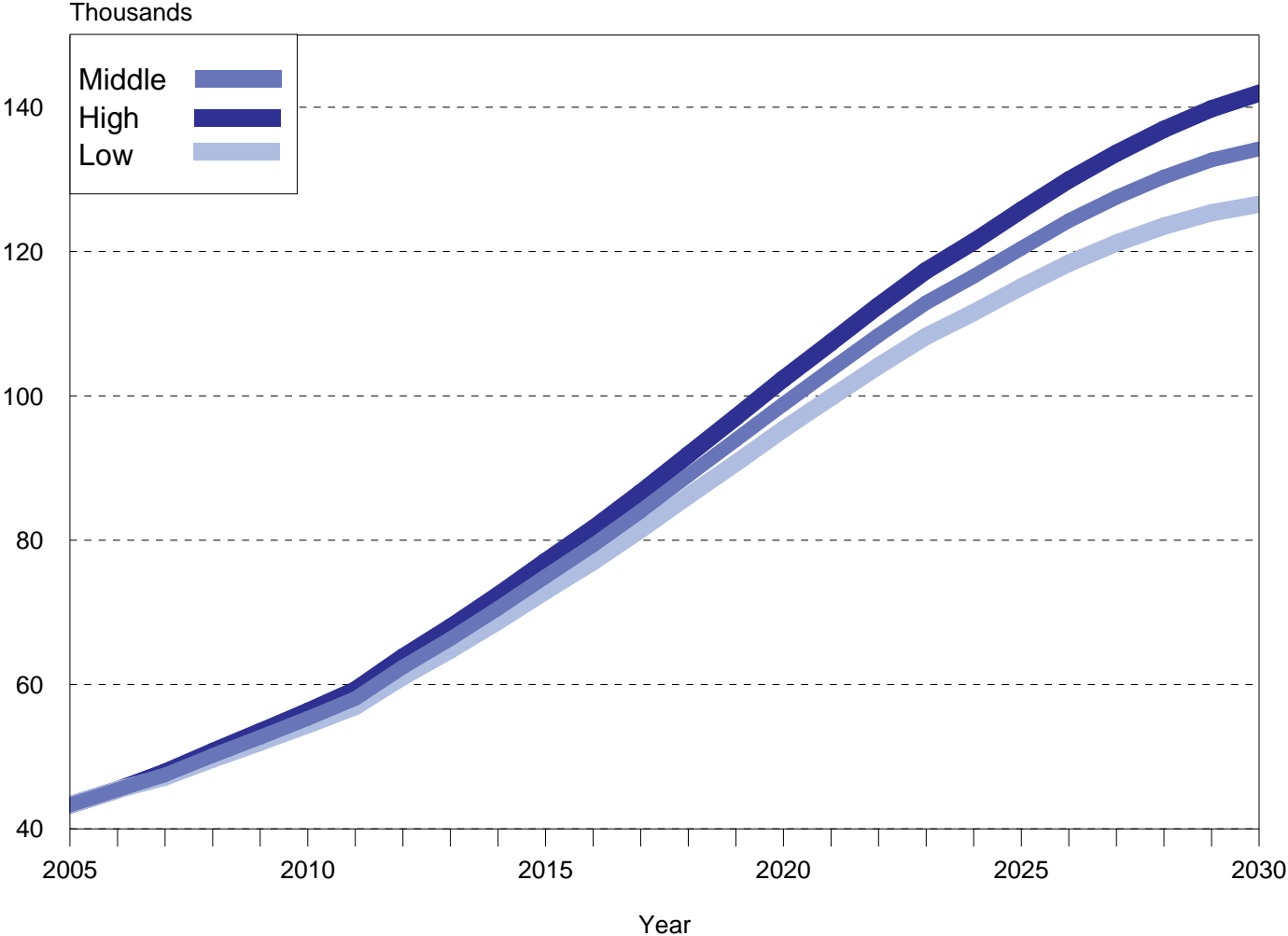
\* Of 2000 paths, "Middle" is the median of the distribution, "High and "Low" are the 90% confidence bounds.  
Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska's Projected Population Ages 18-64 2005-2030



\* Of 2000 paths, "Middle" is the median of the distribution, "High and "Low" are the 90% confidence bounds.  
 Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# Alaska's Projected Population Ages 65+ 2005-2030



\* Of 2000 paths, "Middle" is the median of the distribution, "High and "Low" are the 90% confidence bounds.  
Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

# **Borough and Census Area Projections**

# Methods

Used a traditional, deterministic, cohort component approach for each area.

Calculated fertility and migration separately for each area, and estimated mortality based on the proportion Native American.

The final output was adjusted to the median state projection with 3-D Raking (IPF).

# Potential Future Improvements



Fertility: Use an improved time-series model (variation here seems relatively small).

Migration: With borough, state, and national data, use age specific rates for Out-Migration, and share them back in for In-Migration (“Migrant Pooling”).

Mortality: Project various potential futures for a Mortality index.

Reporting: Use a database rather than high/low variants.

....and many more(!)...

# Thank You!

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More information and complete data: [almis.labor.state.ak.us](http://almis.labor.state.ak.us)



**ALASKA DEPARTMENT OF LABOR  
& WORKFORCE DEVELOPMENT**